

'L'APPÉTIT VIENT EN MANGEANT'

SOME REFLEXIONS ON THE SELF-SUSTAINING TENDENCIES

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I. SELF-SUSTAINING NEEDS AND THE TENSION THEORY OF ACTION

Everyone must be more or less familiar with the situation described by the French proverb which I have chosen as a title for this paper. We are not feeling hungry and have no special urge to eat, but it is a meal-time, and because habit or convention dictates or because someone has actually prepared food for us, we sit down and start eating. Very soon the food to which we were at first indifferent becomes attractive (acquires, as Lewin would say, a 'positive valence') and prompts us to go on eating, so that, in spite of the absence of all perceptible initial hunger, we end by consuming a fair-sized meal with quite definite enjoyment. Comparable situations in other fields are not difficult to find. On a holiday we may feel idle and averse to physical effort, but if, yielding to the exhortations of some more energetic companion, we start on a walk or expedition, after a little while we may begin to enjoy the muscular exertion itself and may even express our gratitude to the disturber of our rest by saying "I'm glad you dragged me out". Similarly, in intellectual work, there are many tasks which, approached at first with reluctance and distaste, soon become so interesting that we may be loath to break them off if some more urgent matter compels an interruption. In the sphere of sex, too, there are many persons (especially women) who may at first submit to the embraces of their lovers with indifference or even with a certain aversion, but whose desire and active participation are presently aroused. Indeed, the capacity to bring about this change, to overcome this initial frigidity, may be among the most valued characteristics of a 'skilful' lover—just as a good cook is one whose dishes 'tempt' the appetite when hunger is not present. Passing from single occasions to longer periods of time, we may recall that there are many activities which we were at first compelled to undertake against our wishes, but which gradually became so fascinating and absorbing that we returned to them, time and again, without any outer compulsion, or even in the face of other claims to our attention. Thus a good teacher may arouse a genuine and permanent interest in some subject that was at first repulsive; while it is generally recognized that a desire for riches or for power may obtain such a hold upon a person that it may continue to be the main driving force of his career, long after the goals to which it was at first incidental have been achieved.

How is the psychologist to account for such familiar situations and attitudes? From the point of view of the psychological hedonism of the nineteenth century there was little difficulty. The activities, once embarked upon, present pleasant or interesting situations,

whether the pleasure is of the senses or the intellect, and since it is a fundamental law of behaviour that we seek pleasure and avoid pain, we naturally endeavour to prolong or renew the situations that are found to afford the particular pleasure concerned. But psychological hedonism has been for the most part abandoned by modern psychologists, though not always whole-heartedly or consistently (see Flugel (1)), and for such the problem is not quite so easily disposed of. The prevalent theory to-day is that conation aims at the relief of tension, and that pleasure is experienced in so far as tension is being relieved, unpleasure in so far as tension is accumulating. Now in the situations in question there appears to be no initial tension (or at most only a minimal one) of the kind that would be relieved by the particular activities concerned. How then can the activities give rise to pleasure? How, in particular, can this pleasure actually increase as the activity is pursued, when the tension is even at the beginning at a minimum, and therefore presumably incapable of being further diminished?

If we are to retain the theory, the answer can only be that new tensions are aroused by, or in the course of, the activity itself, and that the new or increased pleasure is connected with the relief of these new tensions.

As regards the nature of these new tensions, one possible answer would consist in invoking some very general law, such as Spearman's 'first quantitative principle' or the psychoanalysts' principle of 'cathexis'. According to Spearman's principle (which was, it is true, formulated with reference to cognition rather than orexis) "every mind tends to keep its total simultaneous (cognitive) output constant in quantity, however varying in quality" (2), p. 131). Adopting this notion, we could say that every new activity when started can somehow call upon a general fund of mental energy. By a further assumption we could say that this energy manifests itself as tension or desire, and that the activity in question remains pleasant in virtue of the continued reduction of this tension: throughout the duration of the activity tension is constantly being supplied and reduced and the pleasant activity is thus self-perpetuating. Very similar use could be made of the principle of cathexis, according to which the activity in question would be 'invested' with ('libidinal') energy.

There is no doubt some great fundamental truth in this notion (implied in one form or another in many psychological theories) that every activity, once embarked upon, can tap some source of (more or less) general energy. A simple illustration of this truth in the motor sphere would seem to be found in the fact that, as a task becomes more difficult (either through its intrinsic nature or because of increasing fatigue), we call upon successively more distant groups of muscles to help us in its performance; or again, in the fact that when the general muscular tonus has been increased (by preliminary 'limbering') we can with comparative ease carry out physical tasks which are beyond our power when we attempt them immediately after a prolonged period of rest.

But an answer in these terms is too general to be satisfying. Not to speak of the assumptions involved in connecting 'energy' with 'tension' and 'desire' (in the way that we did just above), it is clear that not all the general mental or physical energy is available for every task. Spearman in considering this availability has to invoke his 'engines' as well as his 'energy', while Freud considers not only that there are different distinguishable elements in the 'libido', but also that there are a number of very specific factors responsible for any particular process of 'cathexis'. And, just as the 'cathexes' of the psychoanalysts appear to be capricious and variable, so that much detailed study of them is required

before the sources and channels of energy in any given case can be even approximately explained, so also not all activities once started are equally self-perpetuating; our proverb does not apply with equal force to all of them. There is need, therefore, of a closer examination of the nature of the new tensions that are called into play in any given instance.

In many cases it is not so difficult to see what these new tensions are. They are often of a sensory order. In the case of eating the sensations of taste are obviously concerned; in the case of sexual activity there is stimulation of the sensory organs of the external genitals, reinforced usually by other skin and pressure sensations (and often also of powerful ideational elements); in the case of exercise all the muscle, joint and skin sensations involved in locomotion will come into play. As many psychologists have observed, the experiences connected with all such sensations are far from being purely cognitive in nature, and it is only in the artificial conditions of laboratory introspection that they can become relatively divorced from conation. Thus McDougall tells us that the sensation of 'sweet' is a 'specific excitant' to the process of eating, while Boring (3), in his careful introspective studies of certain classes of sensation connected with the alimentary tract, found that it was sometimes hardly possible to separate the cognitive from the conative aspects of the experiences involved; many such sensations 'meant' a 'call' to a certain kind of action, vomiting, urinating, defaecating, etc. Among cutaneous sensations the sensations of itch are also of this character. They obviously, and indeed often very insistently, 'call' for relief by the process of scratching (see (4), p. 146). In the case of intellectual activities the important stimuli are of course not sensory but ideational: some interest or curiosity is aroused, with an accompanying tension which urges to the solution of a problem, the completion of a task or the increase of knowledge concerning the subject involved (as when one desires to continue the reading of a book, whether this be a work of fiction or a treatise on some branch of knowledge). Finally, in the case of long-distance goals, the situation would seem to be in some respects similar, though more complicated. It is more complicated in two ways: first, in that the activity is not continuous but intermittent (there are long periods in which the goals in question are not consciously present, or at most present only in the background of consciousness, perhaps as guiding 'sets'); secondly, in that the new tensions are themselves likely to be more numerous, varied and complex. The process of acquiring power or riches may require activities of many diverse kinds, and the satisfactions that they bring will vary correspondingly, each adding to the total of enjoyment connected with the ultimate goal that we call 'power' or 'riches', but each prompting to the continuance of activity upon somewhat different lines.

These additional complications are obviously important. They involve, among other things, habits, sentiments (and perhaps complexes), and these are relatively permanent structures of the mind which it is perhaps wise to keep out of the picture as far as possible in a consideration of the simpler examples which relate to a single occasion. This we shall, on the whole, endeavour to do, but it is difficult to do so quite consistently inasmuch as: (1) interruptions are, for one reason or another, liable to occur in any activity, and these may range in duration from a few seconds (or indeed a fraction of a second) to hours, days or weeks, so that there is often a certain arbitrariness in distinguishing between 'continuous' or 'one occasion' activities and activities that are interrupted but resumed; (2) because the pleasure or success that accompanies an activity of the kind under consideration will often, in virtue of the law of effect (or the law of success, if we prefer that term), lead to its being undertaken again in the near future. Nevertheless, even in the narrow field of more

or less continuous activities, examples are sufficiently numerous and varied to make it convenient to use a special term to designate them. We may perhaps consider them to be manifestations of 'self-sustaining' desires, needs or activities; while, by a further less apt but perhaps still justifiable extension, we may refer to the general process involved as 'self-sustenance'.

II. FUNCTIONAL AUTONOMY, THE TENSION THEORY AND THE JOY EMOTIONS

It is clear, I think, that we are here dealing with phenomena which, viewed from a slightly different angle, have already received considerable attention from modern psychologists. They are allied in particular to those which G. W. Allport (5) and elsewhere) has recently considered under the heading of the 'functional autonomy of motives', while they may also have some relation to those which psycho-analysts have for some long time now treated as cases of 'displacement' or 'sublimation'. According to Allport, a line of activity once started may tend to perpetuate itself without further reference to, or call upon, the motives which originally prompted the activity—much perhaps as the internal combustion engine of a car will go on working if its mechanism is once set in action by the starting-handle or by an auxiliary motor run from a battery. With Freud and the psycho-analysts, less stress is laid on the independence of the new or secondary activities from the original motives; these secondary activities are, rather, for the most part regarded as alternative paths along which, under certain circumstances, the original motives may find expression. Nevertheless, in the case of sublimation at least, it is pretty generally agreed that new values or interests have been found which exercise an attraction in their own right, even if they still operate (largely or wholly) with deep instinctive energies originally directed to more primitive ends,¹ while even in the case of neurotic symptoms there is often some 'epinotic gain' which may provide a new and independent motive for their continuance.

In either case we should expect to find some relation between these 'new' values, new paths or new autonomous functions and the 'new' tensions which we spoke of in the examples that we considered in the previous section. The most obvious difference is that in most of the cases that Allport and the psycho-analysts have in mind, the new activities and the original motives are further removed from one another than in the cases suggested by the proverb 'l'appétit vient en mangeant'. The amassing of wealth or the painting of pictures might seem to differ *toto coelo* from the primitive excretory functions with which psycho-analysts have (at least in some cases) found them to be connected, whereas all that our proverb suggests is that when an activity such as eating is once begun, it tends to engender motives that prompt to its continuance in much the same form, even if with greater gusto. Nevertheless, it is difficult to make the distinction an absolute one, for some change of form, however slight, is nearly always involved if an activity is long continued. Allport's examples vary from the 'circular reflex' to cases where the dominating motives of a lifetime appear to have been modified (sometimes by a single 'traumatic' experience), and psycho-analysts have shown that the higher sublimations may often be of slow growth, involving activities of various intermediate grades between the original instinctive behaviour and the final sublimation thereof (see, e.g. Ferenczi(7)).

Furthermore, even if the mechanism prompting to the continuation of an activity in more or less unaltered form may seem of less interest and significance than one that fosters an entirely new activity, it is, nevertheless, far from being unimportant, especially if, as we

¹ For a fuller discussion of this, see J. C. Flugel(6).

have already suggested, it raises a problem from the point of view of the prevailing 'tension' view of behaviour (and the associated 'hormic' theory of the relation between feeling and conation).

Of the writers known to me James Drever Sen. is the one who seems most clearly aware of the nature of this latter problem⁽⁸⁾. He encountered it as a result of his attempt to modify McDougall's theory of emotions. For McDougall each specific instinct has its more or less specific emotion and this emotion is inevitably aroused (at least in some degree) whenever the corresponding instinct is stimulated; the emotion is indeed only the central affective part of the whole instinctive process, which includes cognitive, affective and conative aspects. According to Drever's modification of this theory, only some instincts have an emotional aspect, and with these the emotion is contingent rather than necessary, arising only when some obstacle prevents the instinct from achieving its end easily and rapidly: emotion in fact is a consequence of the rise of tension that follows on frustration, and on this point Drever is in agreement with many other modern writers. An especial merit of his treatment, however, is that he saw the difficulty that is presented to this tension theory of the emotions by the existence of what he called the 'joy emotions'.

According to this tension theory in its simplest form, we might expect that all emotions would be unpleasant, since they spring from some tension, need or disturbance of equilibrium which has to be relieved before the organism is once again fully adjusted and working smoothly. Indeed, by an extension of the theory all feeling, and in the last resort perhaps all consciousness, should be unpleasant, since all activity both psychic and behavioural arises from the existence of tensions—a view which is adumbrated by many authors from Plato to Freud. But since, fortunately and undoubtedly, pleasant consciousness and pleasant emotions exist, the theory (whether in its more restricted form as applying to the emotions or in its extended form as applying to all consciousness) is usually modified and qualified by the further assumptions that the process of relieving tension is accompanied by pleasure, and that the greater the tension that is relieved and the more rapid the process of relief, the greater the pleasure.

Now, according to this modification of the tension theory, we should expect all acute pleasure to be relatively short-lived and to diminish in so far as the tension is relieved and a state of equilibrium or 'Nirvana' once again established. But the joy emotions seem to flourish in a state of activity, to be (within certain limits) the more intense the greater the activity, and therefore presumably the greater the tension. Phenomena like these may be accounted for on certain alternative views: by the theory of psychological hedonism, by the theory of a separate 'life instinct', Eros or libido (the unimpeded manifestations of which are perhaps by their very nature pleasant), by Aristotle's theory of pleasure as accompanying 'perfect function' (either of the organism as a whole or of the parts or faculties concerned). But they are hard to reconcile with the tension view of emotion and behaviour.

One way out of the difficulty would be to admit frankly that neither the tension theory nor the alternative theories fit all the facts. The latter theories could then be used to explain the joy emotions and all the pleasures of activity, the former to explain the distressful emotions and (with the above-mentioned modifications) the pleasures of relief. But such a fundamental dualism is hardly satisfying to those who can only feel at home with an all-embracing theory and for whom a dualistic explanation itself creates a 'tension'. It is not surprising then that the upholders of the tension theory should seek some way of applying

it to active pleasures also. Indeed, what is surprising is rather that they have not made more frequent, vigorous and thoroughgoing attempts in this direction; that, for instance, the implications of Drever's suggestions have not received further consideration and elaboration.

Drever's explanation of the 'joy emotions' is that with these emotions the process of reducing the original tensions (which give rise to the emotions) itself continuously engenders fresh tensions which are themselves then rapidly reduced (he attaches particular importance to the speed of the process). The total tension is thus maintained at a high level, but, inasmuch as it is also being continually reduced, the process is a pleasant (and needless to say, an active and exciting) one. While it lasts, the process is indeed self-perpetuating, each reduction of tension itself arousing fresh tension, which in its turn is then relieved—much perhaps (once again) as in the engine of a car each explosion so moves the piston that another charge of gas is compressed and thus ready for the next explosion. In this analogy, compression would correspond to tension, explosion to relief of tension (and perhaps, though this involves certain further 'teleological' assumptions, the resulting movement of the car towards the desired goal to the pleasure engendered by the total process).

III. NATURE OF THE TENSIONS OPERATIVE IN THE SELF-SUSTAINING NEEDS

Drever's explanation of the joy emotions is thus fundamentally of the same kind as that which, as we have already suggested, must be applied to the case of appetite aroused by eating if the tension theory is to be maintained—and indeed we owe the fullest acknowledgement to Drever in this connexion. But Drever (who only treats the matter in an 'Appendix' to his *Instinct in Man*) tells us little about the nature of the new tensions that, according to his suggestion, are constantly arising in the joy emotions, and perhaps the consideration of the, in some ways parallel but simpler, case of the self-sustaining activity referred to in our proverb may help to throw some further light upon this problem.

As we have seen, the new tensions engendered when we actually start eating are sensory in nature, but sensations of a kind that themselves compel to action, often probably in virtue of an innate mechanism. When we start eating, the taste or smell of the food prompts to a continuance of the eating movements. But, even on the purely sensory level, at least two further factors can be distinguished as adding to the influences at work in maintaining the activity. The first is the inertia or perseveration of the sensations themselves. In the case of eating this is no doubt helped by the existence of edible substances in solution in the saliva, which will stimulate the palate after the more solid contents of a mouthful have been swallowed; but in any case gustatory and tactual sensations have an inertia in virtue of which they persist for an appreciable period after removal of the physical stimulus, and during this period continue to influence conation; "es schmeckt nach mehr", as the Germans say of palatable foods. In the second place, there is the influence of the autonomic nervous system and the associated endocrine glands. In the case of eating and sex the parasympathetic part of the autonomic nervous system will be chiefly concerned, though in some of the joy emotions and in strenuous activities, such as those involved in playing football or tennis, the sympathetic and the related emergency glands, the thyroid, adrenals and pituitary, doubtless also play a part; and these chemical influences, which have a greater inertia than that associated with the functions of the central nervous system, will also tend to keep the process going, to maintain the tensions on which both desire and satisfaction depend.

As we have already suggested, in the case of more intellectual activities (such as solving a problem or reading a book) interest and curiosity—often appealing to already existing sentiments—will of course largely take the place of the simpler physiological mechanisms, while in these and all performances (whether muscular or mental) that can be regarded as ‘tasks’ self-regarding factors, such as those involved in combativeness, competitiveness, self-esteem and ‘level of aspiration’ will also come into play.

Between them, these numerous and somewhat diverse factors may sufficiently account for the new tensions that, in Drever’s view, are being constantly generated (and reduced) in the joy emotions, as they do also for the situations to which our proverb seems naturally to apply. In the case of each of the emotions and situations in question these various factors may be present in various degrees, in some simple cases perhaps only one of them but often more than one, and it would require careful and detailed study of many individual cases to distinguish with precision their respective roles. One circumstance, however, is common to them all if they are to fall into the category that specially concerns us here, i.e. that they are not present (or only minimally present) in the original need that prompts the starting of an activity, but are aroused by and in the course of the activity itself.

IV. SELF-SUSTAINING NEEDS AND THE WORK CURVE

Since ‘work’ is an activity that has been intensively studied by psychologists in laboratory, school and factory, it is natural to ask what part, if any, is played by these factors in the data obtained from these experimental studies. In most such researches the centre of interest has lain in quantitative results or in the general effects of incentive, practice and fatigue rather than in a delicate analysis of motivation, and indeed the distinction made by Kraepelin⁽⁹⁾ in his pioneering work of five major factors influencing the shape of the work curve has fallen a little into disrepute, as it has not always been easy to trace the separate quantitative influence of his factors. Nevertheless, from our present point of view Kraepelin’s analysis is useful, as it seems likely that one of his five factors corresponds just to the particular set of phenomena we have been discussing, while the distinction between this factor and the other four noted by Kraepelin helps also to differentiate these phenomena from other influences from which—in theory at least—they are distinguishable.

Of Kraepelin’s five factors, one, ‘fatigue’ (*Ermüdung*), was responsible for a deterioration of output, while the four others, when acting positively, were favourable to output. Of these ‘practice’ (*Übung*)—when the term is not used, as it is by some other authors, in a very broad sense—would seem to be primarily cognitive rather than orectic in nature. It refers to that smoother and more efficient working that can only be attained through repetition and the resultant closer association of perception, thought and movement in a given correct sequence, so that what was at first performed haltingly, with effort, in relatively clear consciousness and with liability to error, is eventually carried out fluently, with little effort, more or less ‘automatically’ or subconsciously and correctly. It is of course the factor that is of prime importance in trial and error learning, though, if we accept the views of Spearman and the experimental findings of Gopalaswami⁽¹⁰⁾, fundamentally the processes are the same as occur in the more clearly conscious and deliberate forms of learning, i.e. the eduction of relations and correlates. Practice, in this sense at any rate, is not what we are here seeking. Another of Kraepelin’s factors is ‘spurt’ (*Antrieb*), improvement in performance due to short-period intensification of voluntary effort. This

also is not what we require. The other factors are 'adaptation' (*Gewöhnung*) and 'incitement' (*Anregung*). Here we are nearer to what we want. They are both factors that come into play when the work has been proceeding for a little while, and are not, like practice, carried over from one occasion to another in such a degree as to produce marked cumulative effects, nor are they like 'spurt' directly dependent on voluntary effort. 'Adaptation' in this sense would seem to consist in attainment of the proper 'set', so that attitude and attention are optimally adjusted, with minimal interference from irrelevant stimuli, external or internal. This, of course, may result from the influences we have been considering, but would seem to be a secondary consequence rather than a direct expression or reflexion of them. This latter is perhaps best found in the factor of 'incitement', which, as the name itself implies, is more definitely orectic in nature, more dependent on the stimulation, excitement and interest aroused in the course of the actual work, as it proceeds. Here then in this factor, long ago (as the history of psychology is reckoned) described by Kraepelin, we have perhaps the nearest equivalent in the sphere of work to what happens in the more spontaneous and instinctive activities to which the phrase 'l'appétit vient en mangeant' is usually applied.

V. HOW SELF-SUSTAINING ACTIVITIES ARE TERMINATED

As Kraepelin, and of course many others after him, have pointed out, fatigue works against incitement (as also against the other factors tending to improvement or maintenance of output). Its influence is to be seen not only in the case of work curves but in all kinds of reflex, instinctive, or acquired behaviour, and is often responsible for eventually bringing such behaviour to a close after it has been kept going for a period under the influence of self-sustaining factors. After a time fatigue (intellectual or muscular, general or specific as the case may be) produces a desire to desist from the behaviour, and this desire runs counter to the self-sustaining desire and eventually overcomes it, as when we feel a need (which may ultimately become irresistible) to stop walking, reading or thinking and 'have a rest' or change of activity.

Clearly distinguishable from fatigue in some cases is the factor of satiation. Like fatigue, it tends to bring self-sustaining activities to a close, but it does so in a rather different way, viz. by directly abolishing the satisfaction derived from the self-sustaining activity rather than by adding a new and more or less independent unpleasant element, as is usually the case with fatigue. In studying, walking or playing a game, fatigue may show itself by the fact that, even though the activities themselves are still pleasant and interesting, we begin to feel that the intellectual or muscular effort required is telling on us, so that, notwithstanding the continued interest, we may desire to desist because of the new and independent source of unpleasure thus introduced. With eating or sex, on the other hand, the stoppage of the activity is more likely to come about through satiation. The sensations connected with the activity lose their pleasant and self-sustaining character and if persisted in may become positively unpleasant.¹ With eating this is a gradual process, but with sex it tends (especially in the male sex) to take place suddenly and so to speak catastrophically after orgasm, the most intense self-sustenance being followed after a few seconds by its complete disappearance; pleasure of a different and more tranquil sort may indeed persist, but on the

¹ Though not all the sensations concerned need be equally affected at the same time. Thus after long-continued eating the taste sensations may still be pleasant even though other, deeper and more suffused sensations, are beginning to indicate that the organism as a whole is rebelling against further consumption of food. It is clear there is room for research as to the way in which satiation gradually manifests itself.

sensory side at least it has completely changed its character. Though the word 'satiation' is not often used in this connexion, a rather similar, though not perhaps quite so sudden cessation of a need or desire may be experienced in connexion with the excretory processes and with vomiting, while in other than the sensori-motor fields we find again an abrupt transition from (often intense) desire and effort to relief when we suddenly attain a goal, whether this goal consists in the winning of a race or the solution of an intellectual problem.

These last considerations make us realize that it is often desirable to distinguish two ways in which an activity can be terminated. In the one case, there is a clearly marked goal or terminus, on attaining which the activity comes to an end. This goal may be dictated: (a) by external circumstances, physical or social, as when there is no more food to eat or when an order or convention decrees that the activity should stop; (b) by physiological circumstances, as in sexual orgasm or the excretory processes; (c) by mental circumstances, as when a particular problem has been solved. In all these instances the goal is usually achieved suddenly and relief of tension is abrupt. Here we speak more usually of satisfaction, relief or attainment than of satiation. In the other case, there is no such clearly marked goal to bring the activity to a sudden end. It is here that we usually speak of satiation, and it is here too that fatigue and satiation become, as we have indicated, important factors leading to the termination of self-sustaining needs, which might otherwise continue indefinitely. Nevertheless, there is no quite hard and fast distinction between the two types of case, the difference between which is chiefly determined by the relative clearness of the goal and by the time factor. The difference between 'satisfaction' and 'satiation' is therefore not an absolute one, and there is nothing very misleading in applying the latter term to both cases.

In the case of certain activities in which self-sustenance plays a part a third factor may sometimes be responsible for bringing the activity to a close. This is loss of interest through practice and adaptation; after a time the activity loses its 'novelty' or fascination, we feel we have (either permanently or for the time being) exhausted its possibilities of interest for us. We may, for instance, have learnt some new mathematical formula and may be delighted to apply it to some of the examples given in our text-book. Success in the first example may act as a self-sustaining stimulus to tackling the next, and so on; but after a time familiarity with the processes involved is likely to make us lose interest in it and to desire to turn to something fresh. The speed with which the change occurs in such cases depends on a variety of circumstances, some of which may be connected with our general interest in the subject. To one brought up outside the influence of British culture a few minutes' contemplation of a cricket match may be ample to exhaust the mild curiosity-value that the game has for him, while an Englishman, Australian or Indian familiar with the niceties of the game may watch delightedly the whole day through. There are, however, many activities which have a self-sustaining character in the learning stages, but which lose it when adequate skill for ordinary purposes has been attained. Thus in learning to ride a bicycle or drive a car there is usually a stage in which the activity is so full of manageable but still conscious problems (in coping with which we are proud and a little excited about our growing competence) that—unless fatigue has set in—we may be loath to abandon it and desirous of recommencing it at an early moment. But, when the requisite skills have been fully acquired, so that the necessary adjustments can be carried out with a minimum of conscious effort, many persons tend to lose interest in the activity as such and will only cycle or drive for some ulterior purpose. This loss of interest in what has

become an easy and semi-automatic activity is as a rule clearly distinguishable from satiation, though it may have the same result in leading to the discontinuance of an activity—at any rate for its own sake.

Allport in his discussion of functional autonomy rightly stresses the importance of this factor of loss of interest through practice and adaptation, and he makes the general observation—important to bear in mind if we are to understand his position—that it is only when skills are still in process of perfection that there is a desire to exercise them for their own sakes. Those that remain permanently autonomous are, he suggests, of such a kind that they are never 'perfected' and thus continue to present a challenge—as is the case with scientific discovery, artistic production and many games of skill. He also suggests in this connexion that here is the answer to McDougall's objection to Woodworth's earlier contention that 'mechanisms' can become 'drives'. Mechanisms, Allport thinks, can indeed be drives as long as they give rise to conscious problems but cease to be such when they have become quite 'mechanized'; but the more complex skills never attain this degree of perfection, and may therefore continue to be 'drives'. McDougall in his turn, if he were able to reply, would doubtless contend that just this quality of continually presenting problems, indicates that some deep source of instinct is being tapped, e.g. the instinct of self-assertion, as the word 'challenge' suggests, or the instinct of sex (as many psychoanalysts might be inclined to suspect). Of the existence of the interest and the challenge, with the accompanying maintenance of tension as new problems are constantly presented, there can be no reasonable doubt, though whether these depend upon some instinctive source of energy is an aspect of the great contemporary 'instinct' controversy which we cannot pursue further here. All that we are concerned to show is that as long as tension persists the activities tend to continue, while when it ceases through lack of interest the activities lose their self-sustaining character.

Though they may not exhaust the list, fatigue, satiation and loss of interest through adaptation are probably the chief ways in which self-sustaining activities are brought to an end—apart of course from one other process, which applies to these like all other activities, viz. the irruption into consciousness of some new 'prepotent' interest or impulse, usually consequent upon some environmental change, though in human beings it can also occur when some new thought breaks in upon the mind (e.g. that it is time to keep some appointment—or to perform some urgent task). This, together with the factors already mentioned, is probably sufficient to answer the question—practically perhaps superfluous, but obviously of some theoretical interest—how and why self-sustaining desires and activities are eventually terminated?

VI. SELF-SUSTAINING NEEDS AND DEPRIVATION

While dealing with the influences that work in a sense contrary to that of self-sustenance, it is interesting to consider for a moment the relation of self-sustenance to deprivation or lack of satisfaction. The slightly paradoxical element in the proverb '*l'appétit vient en mangeant*' is derived from the fact that we usually (and especially perhaps if we are upholders of the tension theory) consider that appetite and desire arise from lack of satisfaction, not from the very process of satisfaction or relief. There is no corresponding proverb '*l'appétit vient en jeûnant*', probably because its truth would be so very obvious (though Rabelais, in quoting our proverb, felt impelled to add: '*mais la soif s'en va en buvant*'). Indeed the usual method of ensuring the arousal of desire is by depriving ourselves of the

relevant satisfaction for a time. When we are in health, a good appetite can generally be guaranteed by the simple means of not eating for a longer time than usual, and when we have thus made ourselves hungry, we eat more and with a greater gusto than is our wont; we no longer need a choice cuisine to tempt our appetite. And similarly with other forms of satisfaction.

Our stomachs

Will make what's homely savoury; weariness
Can snore upon the flint, when resty sloth
Finds the down pillow hard.

Indeed, as I have pointed out in some detail elsewhere⁽¹¹⁾, there are individuals who, either deliberately or from a certain complexity of mental constitution, habitually increase their tensions with a view to ultimate greater satisfaction, in accordance with the general principle of what I have called 'the increase of satisfaction through inhibition'.

But there are certain exceptions and limits to the general rule that deprivation increases desire. Within limits we can adapt ourselves to plenty, scarcity, or even abstinence. The principle of self-sustenance creates of course an improved adaptation to immediate plenty by enabling us to enjoy it to the full. But since it relates to an immediate situation, its influence soon declines and allows of an adaptation to a withdrawal of the gratifying stimulus. If, for experiment's sake or for some other reason, we suddenly break off eating some delicious dish just when enjoyment of it is at its height, for a few moments a very uncomfortable tension may be felt, but as the self-sustaining elements of desire fade away owing to the appropriate stimulus not being renewed, the lack of further satisfaction becomes quite tolerable and we may soon cease to take note of it—and similarly once again in many other fields.

A similar process of adaptation to the withdrawal of satisfaction applies to longer periods; we become, as we say, 'used to' prolonged abstinence. As has often been observed, complete abstinence may be easier to bear than minimal satisfaction. Hunger seems to disappear during prolonged complete abstinence from food (though of course other undesirable consequences will presently make themselves felt), while prolonged living on a very insufficient diet can give rise to great suffering and intense unsatisfied desire. Much the same holds generally as regards sex (though here the situation is complicated by the fact that substitute gratifications are more easily obtained) and also to such acquired addictions as those relating to alcohol, tobacco or drugs—though not to thirst or the excretory processes. Here is a whole set of interesting problems which have been too little studied by psychologists and physiologists. We said above that we can adapt ourselves to abstinence. But how little we still know of the details of this process of adaptation, of its conditions and limitations, of its relation to habit and attention, to confluence and contrast, to the 'law of pregnancy', to the general tendency to relieve tension, to attain equilibrium or behave in accordance with the 'Nirvana principle'! These are problems with which we obviously cannot deal here. We must content ourselves with pointing out that our principle of self-sustenance must surely play some part in the explanation of the paradox that it is so often easier to tolerate complete lack of gratification (even of a vital biological need such as is involved in feeding) than insufficient gratification. A little gratification arouses the desire for more because it immediately sets in operation some self-sustaining need and thus adds new tensions to those already existing, whereas in complete abstinence these new tensions

are not aroused and the total situation is consequently easier to bear. We can, it would appear, often adapt ourselves to a relatively simple or slowly increasing tension (however biologically disastrous it may be—much perhaps as a fly may not notice a very slowly approaching hand that is about to crush it), but the additional and rapidly changing tensions brought about by occasional partial gratifications (even though this may be biologically preferable to complete abstinence) prevents adaptation and thus renders us much more acutely aware of the nature and intensity of our need.

VII. ACQUIRED SELF-SUSTAINING NEEDS AND THEIR RELATION TO CHARACTER

It is time perhaps to return to the self-sustaining activities themselves, and to say a few more words about their nature and the further problems to which they give rise. We have seen that their range is very considerable and that they also differ a good deal as regards their relative complexity. Perhaps the most obvious basis of classification would be to separate cases into two main groups: each displaying certain major features of a kind that are usually found together. In the first group would be: (a) those that are predominantly sensori-motor in character; (b) closely connected with the original activity itself; (c) this connexion being probably innate. In the second group would be: (α) those that are predominantly ideational in character; (β) less closely connected with the original activity; (γ) this connexion being probably acquired. But the three characteristics that we have labelled (a), (b) and (c) are not invariably found together. Thus some simple sensori-motor activities may (as T. H. Pear⁽¹²⁾ and the culture pattern school of anthropologists have reminded us) be largely influenced by social, and therefore acquired factors. That is why, in view of the existing social pattern of the west, we have hesitated to give drinking as an example alongside of eating. In a moist and not over-warm climate like that of England our drinking (at least of beverages other than pure water) has comparatively little to do with actual thirst. In large sections of the public considerable quantities of (usually alcoholic) liquor are imbibed under the influence of a social pattern, or for directly social purposes. In some individuals, however, the habit of much drinking of alcohol, as a rule originally under social influence, has created a need which may become independent of a social environment, as with the 'solitary drinker'. As we know, such a need may become imperative, give rise to immense distress if it is not gratified and occasion great efforts to secure gratification under difficulties. Here the need, though it may become sensori-motor rather than social is clearly acquired and not innate.

Very similar is the case of tobacco-smoking, an activity which in Europe has increased enormously in recent years, and an acute need for which is probably felt at the present time by a larger number of persons than is the need for alcohol. In former years again much the same may have been true of snuff-taking. Such acquired and self-sustaining needs are excellent examples of what Allport has called the functional autonomy of motives and there can be little doubt that further intensive study of them would throw further light upon our own particular related theme. From what is known it would seem that the needs are not necessarily dependent on any of the more obvious factors that occur to us as likely to be determinants, e.g. (as we have seen) not on the social stimuli that may have started them, nor on chemical influences. (Though these of course have their effects, sometimes very marked, experiment has shown that the effects of small doses of alcohol are largely influenced by suggestion, while under experimental conditions smokers have been

shown to be ignorant whether they are puffing hot air or tobacco smoke.) Every individual who has acquired a self-sustaining need of this kind may develop his idiosyncrasies. Some like only wine, some beer, some whisky, while there are pipe, cigar and cigarette smokers, all of whom may smoke predominantly at certain times and under certain conditions, e.g. for some the visual stimulus of smoke gently rising may be so important that it is pointless to smoke in the dark or in a wind.

These idiosyncrasies superimposed upon certain more general proclivities remind us on the one hand of sexual fetichism and on the other of neurosis. We are all endowed with sexual desires, but at the same time we are all fetichists to some extent, inasmuch as we are stimulated principally or exclusively by certain types of person, certain kinds of dress or circumstance. Though there are certain general kinds of neurosis and certain favoured types of symptom (which, it would seem, may change from culture to culture and from age to age—witness the great reduction in recent years of the ‘classical’ forms of hysteria), each patient has to some extent his own peculiarities, his special varieties of phobia, obsession or ‘conversion’ symptom—all of which can perhaps be traced (though often with difficulty) to the effects of particular events or circumstances reacting on his native characteristics.

And this in turn naturally induces the reflexion that these self-sustaining activities with which we are concerned have much in common with the general process of canalization and conditioning of the sexual instinct in particular and of our instincts in general and also with the special ‘morbid’ conditioning of instincts that are manifested in neuroses. Indeed, alcohol and tobacco addiction might easily be considered as prevalent mass neuroses of an obsessional sort, comparable in kind to more individual ‘tics’, ‘tricks’ and compulsive mannerisms, though just because of their prevalence and their social character they are not usually considered to be pathological.

And if the sensori-motor self-sustaining needs are comparable to the more behavioural obsessions, the ideational self-sustaining activities correspond also to the more ideational obsessions, e.g. compulsive and stereotyped thoughts and anxieties and activities such as arithmomania. Zeigarnik’s⁽¹³⁾ well-known experiment on the retention of finished and unfinished tasks, together with many other experiments carried out by members of Lewin’s school, show that there is a general tendency to complete tasks that are once begun, even though there is no outside necessity compelling us to do so. In other words, the tasks used in these experiments became in a sense self-sustaining activities, even though they may have sunk for a time below the levels of clear consciousness. We have as yet no detailed information as to the nature of the motives that promote the better memory for unfinished tasks, but from several investigations we know that pride or self-regard may play some part in the remembering or forgetting of a task, so that even if the elements responsible for the self-sustenance of the activity may be at bottom of a very general nature and applying to activities of all levels (such, in fact, as might more appropriately be called sets or determining tendencies), it can be modified by the influence of more specific and high-level functions such as those connected with the self-regarding sentiment.

This brings up once again the relation of self-sustaining needs to habits and sentiments, to which we briefly alluded in § I. A habit differs from a self-sustaining need of the simpler sort in that: (1) it represents a more or less permanent structure of the mind and is not to the same extent dependent on immediate conditions; (2) it manifests itself in a repetition of a given piece of behaviour at more or less regular intervals (or on the occurrence of more

or less regularly recurring stimuli) rather than in the continuance of a certain kind of behaviour on a single occasion; (3) it does not so much depend on the generation of new motives or energies as on the canalization of existing ones; (4) it is less associated with pleasure (we have many habits that are indifferent or even unpleasant—compare, for instance, the relative indifference usually associated with brushing the teeth to the pleasures of eating). Adopting Spearman's (2), pp. 132 ff.) distinction, we can say that self-sustaining needs are related to the 'inertia' aspects of retention, habits to the 'facilitation' and 'association' aspects. A self-sustaining need may no doubt help to form a habit by the fact that it is responsible for prolongation of the activity on each occasion of its occurrence, but it is likely that habit is responsible for the inception of the activity on all except the earliest occasions. Thus habit may make us start a meal but the self-sustaining needs help to keep us at it.

Much the same differences would seem to hold as between self-sustaining tendencies and the phenomena which have sometimes (see, e.g. Drever (14), p. 65) been brought under the heading of the 'law of development by stimulation', which asserts that "the more frequently a natural tendency is evoked, other circumstances remaining unchanged, the more readily can it be evoked and the more powerfully does it operate". This law seems to be the orectic counterpart of Spearman's 'law of facilitation' (as distinct from his 'law of association', which corresponds rather to the 'law of transference of impulse'). But the implications of this law (e.g. its relation to the 'law of effect', the 'law of transference of impulse', sentiment formation, etc.) are so complex and the consideration so far devoted to it so relatively small that it seems wiser not to pursue the matter further in this place, taking perhaps in the meantime some comfort and justification from Drever's statement that "the phenomena (covered by the law) could possibly be brought under the general rubric of habit by interpreting that sufficiently widely".

The relation of self-sustaining activities to sentiments is rather similar but more complicated, corresponding to the fact that sentiments are themselves more complicated than habits. Sentiments by their very nature are apt to manifest themselves in behaviour of a wider and more variable kind; thus, as McDougall in particular has stressed, new emotions are liable to be aroused if the object of the sentiment is found in new situations. Sentiments are more dynamic than habits, and if an activity succeeds in stimulating a sentiment the activity may become self-sustaining in virtue of the energy that can be tapped by the sentiment: as illustrated by a case I recently observed of a man who, having been induced rather unwillingly to attend a lecture in the expectation that it would be 'mighty dull', suddenly remarked *sotto voce* to his neighbour, "By Jove, this is what I've always been wondering about", and thereafter listened with the closest attention. In the ideational field, therefore, self-regarding activities are apt to depend very largely on sentiments, either already existing, as in the above case, or *in statu nascendi*, and the arousal of a sentiment on the first occasion can make us ready and willing to return to the activity on a later one. Such self-sustaining activities, however, do not constitute a class of mental 'structures' or 'mechanisms' comparable to sentiments, but are in many cases themselves the natural and inevitable consequences of the existence of sentiments.

The relations of self-sustaining activities to two other mechanisms we have mentioned, viz. 'determining tendencies' and 'sets', are perhaps not quite so easily stated. On the whole, however, we may say that determining tendencies, as usually understood, differ from self-sustaining activities in: (a) being started by a more or less voluntary decision

(though this is less the case in sets, as the term is often used); (b) manifesting themselves in a state of readiness rather than in continuous activity; (c) being more frequently and intimately connected with definite goals, the attainment of which brings the determining tendency to a more or less abrupt end (in the way indicated in § V, p. 178). Certain features, which determining tendencies and self-sustaining activities might seem to have in common, concern the maintenance of tension involved in the state of 'readiness' occasioned by the former. Here we can only suggest that this 'readiness' tension is: (a) largely subliminal (whereas in the self-sustaining needs the tension is supraliminal), and (b) maintained by the original—still unfulfilled—determination (as contrasted with the 'new' and secondary needs or desires that are characteristic of the self-sustaining activities).

And what of functional autonomy? Phenomenologically speaking, there can be no doubt that Allport is correct in insisting that many activities once started may continue automatically without any obvious reference to the motives (instinctive or otherwise) which may have led to their inception. Our self-sustaining activities are of course functionally autonomous in this sense. In his controversy with the upholders of instinct Allport has, however, perhaps a little unnecessarily stressed the novelty and mystery of functional autonomy. Our own previous considerations in this paper have, it may be hoped, somewhat reduced the element of mystery by showing that a few already known factors may account for many of the phenomena that Allport brings into this category. As regards one-occasion activities we have in particular: (a) sensations intimately (either innately or as the result of habit) linked to particular conations, and (b) interest depending upon the arousal of sentiments; while as regards activities that are frequently resumed we have: (a) habit (brought into being by the law of effect), or (b) sentiment (which may lead to spontaneous resumption when the mind is not otherwise engaged or to resumption on the occurrence of any stimulus—sometimes quite a feeble one—that may prompt in the required direction).

We know very little concerning the relation of self-sustaining activities to such aspects of the mind as the '*p*' '*w*' and '*f*' of the factor school, the super-ego of the psycho-analysts or Jung's introversion and extraversion. We might at first be inclined to suspect a close positive relation between the tendency to the formation of self-sustaining needs on the one hand, and 'perseveration', 'secondary function' or 'ergic rigidity' on the other; there is especially an obvious resemblance between certain varieties of the former that we have just been considering and such quasi-obsessional instances of 'perseveration' as a tune or jingle running in the head or the need to resume unfinished tasks as studied by Lewin and his pupils. It might also seem likely that there is a similar relation with the more definitely motor forms of perseveration mostly used as tests of '*p*'. But '*p*' has shown itself to be a much narrower factor than Otto Gross (15), the great theoretical exponent of 'secondary function' had thought it to be, and although later investigators have shown that it has in its extremer forms indeed certain special relationships with '*w*' or moral consistency, it seems clear that the attractive hypothesis of a general neural tendency to perseveration affecting in much the same way all mental levels is no longer justified. Since, moreover, we are still quite ignorant as to whether there is anything in the nature of a 'factor' of self-sustenance in virtue of which individuals who are liable to form self-sustaining needs in one sphere are liable to form them in another sphere with a corresponding degree of intensity, it is better perhaps to abstain from speculations as to any relation between self-sustenance and the factors so far unearthed by the factor school.

VIII. SELF-SUSTAINING NEEDS AND THE PERSISTENCE OF MOTIVES

One very general philosophical reflexion, however, we may perhaps allow ourselves. Persistence of action until a goal has been achieved or a tension removed is one of the fundamental characteristics of life, and within certain limits and qualifications we may say that the higher the form of life the greater the degree of this persistence—a persistence which gives orderliness and integration to vital activity. Human beings are in general more persistent than animals, adults than children, the moral and intelligent than the delinquent, the unstable and the stupid. This persistence implies continuous concentration on a given task or problem once selected and relative neglect of what are for the moment 'irrelevant' stimuli. The arousal of self-sustaining needs must obviously help towards such concentration. They keep us at our dinners or our work, so that we are not liable to be distracted from these important occupations by every passing event that happens in our neighbourhood or every stray thought that enters our heads. They do this, as we have seen, by creating fresh tensions in the very process of relieving existing ones. Sometimes, as in the simplest instances, these new tensions impel us merely to the continuance of a relatively monotonous 'circular' activity. At higher levels, however, they impel to constantly varying activities of behaviour or of thought, as when we are driven to take the successive steps necessary for the solution of a complicated problem.

Of course persistence of this kind may have its drawbacks as well as its advantages—the drawbacks attached to all fixity of structure and canalization of function, from simple habits to the most exalted sentiments, viz. that they to some extent limit our possibilities of reaction and may make us treat as 'irrelevant' stimuli that are really of importance. Köpke's studies (described by Lewin⁽¹⁶⁾) on the spontaneous resumption of experimentally interrupted tasks showed that the mentally defective suffered from a relative 'rigidity' of tension systems, as a result of which they tended to find either complete satisfaction in a substitute task or no satisfaction at all, whereas normal individuals with a greater flexibility of mind gave evidence of finding a partial satisfaction, a partial lowering of their tensions in this way. The psycho-analysts on their side have of course demonstrated very fully the disadvantages inherent in the rigidity and unadaptability of the more primitive and unconscious layers of the super-ego, which may often be in serious conflict with a more conscious, adult and 'reasonable' moral code. In the experiments on perseverance too it has been shown that extreme perseverance (like extreme lack of perseverance) is often associated with moral backwardness. In these instances perseverance at lower levels may prevent the development of higher levels. But even at the highest levels some drawbacks are still present. The intense absorption in a problem characteristic of great thinkers and artists may render them unpractical in everyday affairs, as is witnessed by the proverbial absent-mindedness of professors, and by the story of Archimedes who, concentrated on some mathematical problem, failed to take seriously the irruption into his study of a Roman soldier and lost his life in consequence. Like all good things, persistence (in which, as we have seen, self-sustaining activities play a significant part) has the inevitable defects of its merits. Nevertheless, on the whole there can be no doubt that the tendency to persevere in an activity caused by the maintenance of tension until some—perhaps complex, difficult and distant—goal has been achieved is of the highest biological value and has in particular contributed immensely to the achievements of the human race.

It is indeed what I have elsewhere ventured to call a 'fundamental paradox of life' that

in the very process of seeking to relieve our needs we are creating ever fresh ones. In endeavouring to attain an optimal 'adjustment of internal relations to external relations' (to use Herbert Spencer's definition of life), our thoughts and actions—whether for dealing with a problem actually confronting us or one that we are anticipating—become ever more complicated. In other words, fresh problems—problems of means or of subsidiary aims—are constantly arising, so that new tensions are constantly aroused. The fact that in eating, or in any other of the activities to which the phrase '*l'appétit vient en mangeant*' may apply, a new and secondary appetite is aroused in the very process of satisfying a fundamental biological need, is only a particular example of this very general tendency. And indeed our own reflexions on the little problem we have chosen themselves exemplify this tendency. Starting from an everyday occurrence so familiar that it might seem hardly worth discussing, we have now found ourselves concerned with questions relating to the ultimate nature of all vital activity—and even though any slight tensions relating to our theme that we may at first have felt have perhaps been to some extent alleviated, other and vaster tensions have been engendered in the process. We can only hope that the reader's appetite may have been sufficiently aroused to cope with the unexpectedly large and perhaps not too easily digestible meal with which he has found himself confronted.

IX. SELF-SUSTAINING NEEDS AND PLEASURE

Reflexions of this order are apt to be disturbing. The fact that it is hard to relieve our tensions without arousing others may seem to justify a pessimistic outlook on life in general, and human life in particular. Varendonck⁽¹⁷⁾ indeed tells us that in virtue of the very facts we have been considering man "is continuously tormented by desire". And yet our proverb is usually quoted with no such pessimistic implications and Drever's considerations which we related to it are concerned with the 'joy emotions'. How is it then that self-sustaining needs can so often be a source of happiness and pleasure? Here we have one last problem about which we must surely say a few words in conclusion.

Drever's answer as regards the joy emotions is to the effect that the new tensions are themselves being continually and rapidly reduced—presumably at least as fast as they are engendered. Here clearly there is room for mathematical speculation, but in our vast ignorance of the ultimate nature of mental tensions and the forms of their interaction it would be of doubtful profit. According to the usual form of the hormic-tension theory (which explains pleasure as connected with the lowering of tension and unpleasure with its increase) we should expect that if the reduction and the renewal of the tensions involved are approximately equal, the resulting experience would be one of indifference rather than of joy or pleasure. We must therefore—in terms of the tension theory—suppose that on the whole the reduction of tension is greater than the increase. And if we assume further, as is perhaps usually (though often implicitly) done, that there is a more or less simple and direct correspondence between intensity of pleasure and amount of reduction of tension in a given time, it becomes difficult to see how the balance of reduction over regeneration of tension can be so great as to correspond to any state that we should call joy, especially in view of the fact that the joy emotions can often last a considerable time with relatively little fluctuation.

Perhaps, however, the case of '*l'appétit vient en mangeant*' can help us here again—at least so far as to point in the direction in which we may begin to look for a solution. In

eating we deal with mouthfuls rather than with dishes or full meals. The conations set up by the taste of each mouthful enable us to deal with each mouthful rapidly, confidently and successfully; we do not worry about what remains on the dish or what courses are to follow—or if we do think about them it is with a feeling of confidence that we shall be able to deal with them when their turn arrives. Two points are of importance here. First, the time element: the fact that there is no delay between the application of the stimulus and the beginning of relief of tension. Secondly, the fact that we deal with the whole problem piecemeal and thus in manageable form, and in so far as we contemplate it in its totality, we do so vaguely but with confidence. The tensions we are dealing with at any moment are thus not those connected with the total situation, as it would appear were we to contemplate it in its totality and try to deal with it fully and at once; but rather those connected with some small time-fragment of this total situation—and these tensions we *can* deal with, and in such a way as to reduce them rapidly.

If there is any change in these respects, if, for instance, our salivary glands fail to function adequately, by reason of strong emotion or from any other cause, our pleasant 'appetite' vanishes and gives place to frustration and a feeling of nausea and anxiety, both with regard to the immediate mouthful and to the meal to follow. The situation would seem to be similar in essential respects in the case of solving an intellectual task. Just as a meal consists of many mouthfuls, so most intellectual tasks involve a number of steps, stages or sub-problems (though these will probably be more diverse in character than the successive mouthfuls of a meal). In so far as we are successfully dealing with each step as it arises we experience satisfaction, and in so far as we feel that we shall be able to deal with the remaining steps in due course, we can look forward to the completion of the task with pleasant confidence. True, the pleasure here is as a rule not so continuous and unalloyed—and for the reason that we are more likely to be held up for a time by not being able to solve the step immediately before us; our intellectual powers are seldom as adequate to their task as are our salivary glands and the other organs involved in eating. At these moments when the (intellectual) stimuli cannot be adequately dealt with, tension arises and unpleasure replaces pleasure till the solution has been found. Similarly, in the case of the 'joy emotions', joy gives place to anxiety or some other unpleasant emotion if our powers seem unequal to the demand made upon them. Again, if we take too long-term a view of our problem as a whole we may easily feel overwhelmed at its complexity (and indeed ultimately at the complexity of life itself), and thus prevented from 'getting on with the job', i.e. from adopting efficiently the piecemeal procedure that may lead us to success. Although, so far as cognition is concerned, a long-term view is no doubt essential to the higher types of adjustment, if we allow it permanently to dominate our orectic life we shall become too distracted, worried and depressed to engage with gusto in the steps that lie immediately before us. Here perhaps we get some further insight into the probable connexion of the liability to joy emotions (and pleasure in activity generally) with certain 'types' or 'factors'—'extraversion', 'rhythymia', 'surgency', etc.—as also with the results of psycho-therapy or prefrontal leucotomy in reducing the tyranny of a too active super-ego.

Again in some such way as this (i.e. by stressing the importance of the piecemeal procedure) it might be possible to reconcile the tension theory of feeling and emotion with the optimal function theory of Aristotle, and such corresponding modern physiological theories as have been propounded by Grant Allen, Marshall, Lehmann and others—theories which

stress the relations between the energy demanded by a task and the energy at our disposal for dealing with it. But the reader, if not already fatigued, will certainly be satiated by this long sequence of theoretical reflexions and his appetite (as indeed that of the writer) unequal to what might prove to be another 'filling' and substantial dish.

X. SUMMARY

1. Certain 'self-sustaining' needs, desires or activities, when once aroused, may continue and even gain in intensity and occasion prolonged satisfaction in a way that is not explained by the intensity of the original stimulus and that is difficult to account for in terms of the hormic-tension theory of feeling and action. These self-sustaining needs, together with their consequences, would seem to be due to the influence of new or secondary needs or desires which are aroused by the very process of attempting to satisfy the needs that originally started the activities. These new needs may be sensory or ideational according to the nature of the activity concerned.

2. The process involved here is similar to that suggested by Drever in explanation of the joy emotions.

3. The nature of the secondary needs, sensory and ideational, is more closely considered.

4. Self-sustaining needs may affect the work curve in the manner described by Kraepelin under the heading of Incitement (*Anregung*).

5. Self-sustaining activities may be terminated through fatigue, satiation (gradual or abrupt), loss of interest through improved skill and (like all other activities) by the arousal of some other 'prepotent' tendency.

6. The arousal of desire by the very process of satisfaction contrasts strangely with the more familiar method of arousal through deprivation. The principle involved in self-sustaining desires may, however, account for the fact that partial deprivation is sometimes harder to bear than complete deprivation.

7. Self-sustaining desires are considered in relation to innate and acquired tendencies, social factors, canalization of instincts, obsessional neurosis, habit, sentiment, determining tendencies, functional autonomy, perseveration, etc.

8. Self-sustaining desires may play a part in the general persistence of motives that is a characteristic of developed life. Such persistence of motives, however, may have its drawbacks in impeding further development and in limiting the possibilities of reaction.

9. The pleasure involved in the joy emotions and other active states may perhaps be explained by the adoption of a 'piecemeal' procedure, as a result of which the mind is continually active in reducing some small fraction of the total tensions engendered by a situation.

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HAPPINESS AND UNHAPPINESS IN THE CHILDHOOD AND ADOLESCENCE OF A GROUP OF WOMEN STUDENTS

BY W. D. WALL

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I. INTRODUCTORY

From Hall⁽¹⁾ onwards, many writers have spoken of adolescence as a period of storm and stress and, although more or less adequate justice has been done to the heightened responsiveness to joyous stimuli shown by many in the 'teens, the tacit assumption is apparent in the writings of many authorities that adolescence is a period of emotional difficulty and unhappiness. Hollingworth⁽²⁾ emphasizes the other view when she writes that for the most part adolescents may be seen going about their business like ordinary folk. So, too, Benedict⁽³⁾ and Mead⁽⁴⁾, pp. 5, 40; (5), p. 111) suggest that the emotional tensions of the period are the product not so much of causes arising from within as of the environmental circumstances in which the developing child finds itself.

Much of the data which we have of a qualitative sort consists in case studies of boys and girls who are abnormal in some way—delinquent, neurotic, or specially gifted verbally. There are a number of American studies based upon comparatively large samples of representative groups, for example, those summarized by Hollingworth⁽²⁾, Arlitt⁽⁶⁾ and Cole⁽⁷⁾; but the social, economic and educational differences are such that these are no more than suggestive for English youth. Material derived from English student groups by means of questionnaires has been published by Valentine⁽⁸⁾ and by Wheeler⁽⁹⁾, who also included in her survey the reminiscences of adolescence of adult workers attending W.E.A. classes. The present writer has elsewhere published a similar study of young adolescent workers⁽¹⁰⁾, chap. iv). Special topics have been dealt with by Phillips^(11, 12) and Vernon⁽¹³⁾. So far as the writer is aware, no study of the present kind has been published in England.

The present investigation is an attempt to gain a broad view—as adolescents themselves see it—of the change in the impact of the psychological environment which takes place between late childhood and the early 'teens, and to assess something of the direction and degree of its effects. In such a study, idiosyncrasies of temperament and peculiarities of experience are likely to be of such importance that a questionnaire, even consisting of a large number of more or less controlled response questions, scarcely seems the best method of approach. The personal interview has the disadvantage of being cumbersome

and prohibitive where a large sample is required and the resistances aroused even by the most discreet personal questioning may well invalidate much of the data.¹

Accordingly, for the present purpose, a group was chosen as homogeneous as possible in sex, age, education and social background; and, in the hope of retaining something of the spontaneity of the interview as well as the advantage of anonymity given by the questionnaire, a very loosely framed series of questions was used. The group consisted of 109 women education students in the University two-year training course and nineteen women students in the one-year post-graduate course for the Diploma in Education. In the case of the two-year students, most of the schedules (described below) were distributed by colleagues of the writer² to two successive first-year groups before they had proceeded very far in their course in psychology and certainly before the topic of adolescence had been dealt with. The nineteen Diploma students completed their schedules at home and returned them to me by post. All the schedules distributed were returned completed and the sample, therefore, does not suffer from uncontrolled selection. On the schedules themselves, and while they were being distributed, it was emphasized that all replies should be as frank and full as possible and that they would be treated as absolutely confidential and anonymous.

The form of the schedule was as follows:

CONFIDENTIAL

Age: Yrs..... Mths..... Sex.....

No one who knows you will read this and it will help if you will be as frank as you possibly can.

Please do not write your name anywhere on this sheet.

1. Were you on the whole happy during childhood?

Yes. No: (Underline one.)

If you wish to add anything to your answer, please do so here:

2. Which things, persons, events and so on in your childhood caused you unhappiness or happiness?
3. Have you on the whole been happy since the age of twelve or thirteen?

Yes. No. (Underline one.)

If you wish to add anything to your answer, please do so here:

4. Which things, persons, events and so on have caused you happiness or unhappiness since the age of twelve or thirteen?

After each question, ample space was left for replies, and it was suggested that the reverse of the foolscap sheet on which the questionnaires were printed might also be used.

The average age of the group was 19, and the range 17+ to 24, though very few fell outside the limits of 18-20. All may therefore be regarded as late adolescent or young adult, near enough to the experiences of the 'teens to recollect them clearly, but sufficiently removed from them to have some degree of objectivity. All the writers are above the general average in innate intelligence and in powers of self-expression and, from the fullness and detail of most of the replies, I am convinced that the material is free at least from *conscious* suppression or sophistication. There remain, of course, the elements of unconscious sophistication, displacement of affect, unconscious meanings arising within emotionally toned situations, the rounding out of events, rationalizations,

¹ Frank(14) points out that "When we ask an individual to tell what he believes or feels or to indicate in which categories he belongs, this social pressure to conform to the group norm operates to bias what he has to say and presses him to fit himself into the categories of the inventory or questionnaire offered for self diagnosis." This remark is echoed by Blos(15), who regards uncoerced and undefined situations such as creative writing or interview as superior to questionnaires or tests. It was with such considerations in view that the method of the present inquiry was devised.

² I should here like to thank Mrs N. M. Barnett and Miss M. Brearley for their co-operation in this research.

conventionalizations, and partial or complete amnesias of painful experiences. Such uncontrollable factors are present in any situation involving recall, except possibly that of deep analysis: but, as Phillips has suggested ((11), p. 33), one of the "main benefits conferred by psycho-analysis may ultimately prove to have been the discovery of new categories of thought, which can later be made use of on the conscious level" and awareness of resistances, distortions and amnesias, so common now among the educated, almost certainly reduces their effect. So, too—apart from certain complexes which are assumed (often on the scantiest of evidence, as shown by Valentine (16), chap. xvii) to be generally characteristic of most of us—idiosyncrasies of repression and displacement are likely to be scattered in a group such as this in a more or less random fashion, and while they may affect individuals, are likely to cancel out in a sample of the present size. Moreover, while we may accept as a fact that even in intelligently self-aware adults, unconscious processes have profound influence on conscious conduct, the *control* of behaviour depends at least as much upon consciously recognized factors in the environment and upon attitudes and feelings amenable to introspection.

II. QUANTITATIVE FINDINGS

(a) *The general emotional set*

With these cautions in mind, we may proceed to a description of the results. The most striking quantitative fact which emerges is that, at both periods of life, the overwhelming majority rate themselves as being on the whole happy. Table 1 sets out the results derived from Questions 1 and 3.

Table 1. *Percentages of the group (128 women) reporting themselves as happy or unhappy during childhood and adolescence*

Happy in childhood and adolescence	Happy in childhood, unhappy in adolescence	Unhappy in childhood, happy in adolescence	Unhappy during both periods
81.6	10.9	6.6	0.8

It will be noticed that there is a slight absolute increase (4.3 %) in the numbers of the unhappy after the age of 12 or 13, but this is not statistically significant ($P=0.199$).¹ We can, therefore, assume that for most girls of this type and background, the 'teens are not a period of prolonged unhappiness or even a time at which unhappy experiences predominate. That this should be so, however, is not inconsistent with a profound difference in the balance of happy and unhappy experience. A necessarily inexact but useful indication of this may be obtained by counting the mentions of stimuli to happy or unhappy emotion made by the group when writing of their childhood and adolescence. 416 incidents, situations, persons or things are mentioned by the group when writing of their childhood, and 581 when the 'teens are dealt with. Table 2 shows how differently these mentions are distributed at the two periods of life.

Table 2. *Distribution of mentions of happy and unhappy stimuli in childhood and adolescence (128 women students)*

	Total no of mentions	Percentage happy	Percentage unhappy	Significance of difference
Childhood	416	68.4	31.6	$P<0.01$
Adolescence	581	53.3	46.7	

¹ χ^2 calculated for these and the following tables by the usual method and P derived from the table given by Fisher ((17), pp. 110-11).

It will be seen that happy memories of childhood outweigh the unhappy by two to one, while in adolescence the preponderance of happy memories is only just achieved—and this with a group in no way abnormal but rather presenting a carefree, well-adjusted appearance to the casual eye. This variation of emphasis is too marked to be ascribed solely to the known tendency to forget unhappy and remember happy experiences. Within the limitations of a different approach it agrees with the results obtained by Watson (18) and Sailer (19), both of whom concur that the tendency is for most people to consider themselves more or less happy. Symonds (20), in a research which concerned adolescents of both sexes and which is closer in content to the present one than either of the others, finds that of his group, two-thirds of College and Graduate students consider themselves to fall in the category “contented at times and at other times discontented, life has both favourable and unfavourable features”, though only $1\frac{1}{2}\%$ rated themselves as “satisfied, comfortable”, “cheerful, successful, optimistic”, or “full of deep joy”.

It is fair to conclude from these figures that, for the women of this group at all events, the adolescent years were more vexed with at least transitory causes of unhappiness, than was the immediately preceding period of late childhood and possibly, though this is more speculative, than any other since early nursery days.

(b) Age incidence of changes

There are, too, indications that for some at least of these young women there were phases during the 'teens, when they were relatively more or less happy than at others. Attention was not specifically directed by the questions to this particular point and it is the more striking therefore that it is only in adolescence that these broad variations are mentioned. Fourteen girls state that for a year or two after the age of 14 they were markedly less happy; three regarded 15 as a change for the worse; nine mention 16; two 17; four 18 and one 19. On the other hand, five say that they were happier from 14, two from 15, five from 16, one from 17, six from 18, and two from 19.

One cannot press too far the analysis of such figures, but they reveal a slight but not altogether significant preponderance ($P=0.09$) of those who find the years up to 17 more subject to stress and of those who find the later 'teens a period of better adjustment. In the literature there are a number of collateral indications that the mid 'teens may be regarded as a climacteric for many though the precise age relationship is—as one would expect from its dependence upon factors of environment and of maturity—obscure (see the summary of evidence on this point in (10), chap. iv).

(c) Changes in the relative importance of the major fields of experience

It is possible to push quantitative analysis a step further and to classify the mentions of incidents, persons, situations or things in certain fairly well-defined categories, roughly corresponding to fields of experience or aspects of the psychological environment in childhood and adolescence. In no sense, however, can any of the categories which follow be considered as shut away from any of the others; they are all interrelated and adjustments made in one will affect adjustments in others: nevertheless, it is legitimate to separate them for study.

The categories ultimately adopted were seven in number, defined as follows:

(i) *Family group.* In this were recorded all references to parents, siblings, close relatives, family treats, family events and so on.

(ii) *School and university.* This category included all experiences directly related to the educational situation—relationships with staff, educational success or failure, membership of school organizations, reactions against or in favour of school or university work, rules and so on, and social relationships (other than those connected primarily with evacuation) arising directly out of the school or university life.

(iii) *Physical environment.* Direct references to country or town life, experiences connected with holidays in the country or by the sea, and with evacuation in other than its personal relationships were classified under this head.

(iv) *Social relationships.* All relationships to contemporaries, to adults other than members of the family or of school or university staff, social activities, such as membership of clubs, Guides, etc., dances or parties, allusions to personal physical appearance in its social reference, general mentions of difficulties experienced in relation to others and adjustments to members of the opposite sex are included here.

(v) *Games, sports, hobbies and interests, etc.* Into this section fall all mentions of activities undertaken apparently primarily for their own sake rather than for academic reasons or for the opportunities for social intercourse which they afford. As well as games and sports, such things as music, creative activities like embroidery and making collections, reading and so on are included here.

(vi) *Personal future.* A small proportion of the group made specific mentions of vocational interests and ambitions when writing of their adolescence and such are included under this head.

(vii) *Miscellaneous.* In some ways this is a highly significant category as will be seen when we come to discuss the qualitative results. Mainly it contains those references to emotional preoccupations not arising directly from the environment—religious or political conversion, instability of mood, general sense of well-being, more or less groundless fears and so on.

It will be seen that most of these categories are fairly well defined though in some respects quite arbitrary. In practice very few of the statements made overlapped two or more categories and such have usually been scored in both, unless it was quite clear where the preponderating emotional emphasis lay. In a few there was some considerable doubt as to the correct category. Such cases have either been assigned to the Miscellaneous section or interpreted in the light of surrounding material. All the schedules have been analysed independently twice, once by my wife and once by myself. The ultimate differences in assignment were negligible.

The results of this analysis are shown in Table 3. In columns i and ii of this table are shown the percentages of the group who made at least one mention of a topic falling within the particular category. In columns iii, iv, v and vi are shown the percentages of mentions in childhood and in adolescence which fall into the happy and unhappy categories. The last two columns show the degree of statistical significance which can be attached to the differences between columns i and ii, and between columns iii and iv as compared with columns v and vi.

Even bearing in mind the possibilities of sophistication in the data themselves and in the method of analysis, the figures of columns i and ii show a profound and far-reaching change in the relative importance at the two periods of certain major fields of experience. Clearly indicated is the decline in the importance of the home and family at adolescence and an increase in responsiveness to wider social groupings at school, university and among friends and contemporaries. This has, of course, been observed and commented on before—for example by Valentine (8). In susceptibility to the physical environment, too, there is a marked and significant rise in the 'teens, though its interpretation in these data is made difficult because so many of the group were evacuated or otherwise directly affected by the abnormal conditions of wartime. The miscellaneous category, too, shows a considerable increase in adolescence and presents difficulties of interpretation. From the frequency of references in the later 'teens to fears of death, of violence, to religious conversion and to inexplicable moodiness, etc., we may interpret it as indirect evidence of intensified emotionality and of increased introspectiveness. In only one category is the

difference between the two periods not significantly marked. There is a slight absolute increase in the numbers who mention hobbies, games and sports as of importance in their 'teens, but, as we shall see later, the chief difference between the two periods of life in this respect is qualitative.

The figures of columns iii, iv, v and vi give a broad picture of how the change is felt. The general increase in the proportion of unhappy experiences mentioned, which, as has already been pointed out, marks the adolescent years of this group, is very unevenly distributed within the separate fields of experience, though in almost all there seems to be a relative increase in unhappiness. The most marked change occurs in the references to experiences within the *family group* which, in childhood preponderantly happy, are in adolescence preponderantly unhappy. So, too, the references to the *physical environment* show a considerable relative increase in mentions of unhappiness during the 'teens. Of considerable interest, too, is the fact that *personal relationships*, significantly more important to these

Table 3. *The relative importance of various fields of experience in happiness and unhappiness in childhood and adolescence (128 young women)*

Field of experience	Percentage of group mentioning		Distribution of mentions				Significance ¹	
			Childhood		Adolescence		Columns i and ii	Columns iii, iv, v and vi
	Childhood	Adolescence	Happy	Unhappy	Happy	Unhappy		
	i	ii	iii	iv	v	vi		
Family group	76.6	44.5	33.2	15.1	10.5	13.8	$P < 0.01$	$P < 0.01$
School and university	46.9	65.6	11.1	6.0	12.4	10.0	$P < 0.01$	Not significant
Physical environment	11.7	26.6	3.6	0.7	3.4	3.8	$P < 0.01$	$P = 0.011$
Social relationships	39.1	54.7	8.9	6.2	11.5	11.7	$P = 0.013$	Not significant
Games, sports, hobbies and interests	17.2	23.4	6.5	0.2	9.3	0.2	Not significant	Not significant
Personal future	0.0	13.3	0.0	0.0	1.7	3.4	$P < 0.01$	Not significant
Miscellaneous	7.8	27.4	5.1	3.4	4.5	3.8	$P < 0.01$	Not significant

¹ χ^2 calculated from 2×2 tables entered with the *raw* numbers (of subjects, columns i and ii—or of mentions made, columns iii and vi). Where necessary Yates's correction for continuity has been made.

girls in their 'teens than in their childhood, are not significantly more productive of unhappiness or happiness, but are in fact almost equipoised. A similar trend is noticeable in the references to *school and university* and in the *miscellaneous* field. In contradistinction to these, *hobbies, games and sports, etc.*, at both periods, are of importance and at both periods overwhelmingly productive of happiness. Other than the *family group*, the question of *personal future* is the only one to which there are noticeably more references as a cause of unhappiness than as a cause of happiness.

We may now turn to a closer and more qualitative examination of the broad categories of Table 3. In considering what follows, however, it must be borne in mind that the answers were spontaneous and directed only in the most general way: hence the frequencies cited are very different from (and certainly much lower than) those which would have been obtained had specific questions been put on the topics raised. The implication of this is that only if a particular experience was of marked importance in the emotional life of the period would it achieve mention.

III. QUALITATIVE RESULTS

(a) *Family group*

In Table 4 are shown the proportions of the group of 128 who mention various subdivisions of experience in the *family group*.

We have already noted, in discussing Table 3, that the 'teens are marked by a decline in the relative importance of the home and family. The figures of the present table throw light on a subtle redistribution of emotional emphasis within the family environment. The most striking single change is the marked increase in the numbers who mention coming into unhappy conflict with their parents in adolescence. If we add to these the number who mention their resentment of the restrictions put upon them at home, we find that nearly one-third of this group of girls is in some degree critical of the home atmosphere.

Table 4. *Percentages of the group referring to particular aspects of family group*

	Home in general	Parents	Siblings	Toys, treats, holidays	Relatives	Freedom from restraint	Death, illness
			Childhood				
Happiness	18.8	25.4	17.2	33.6	7.8	0.8	0.0
Unhappiness	3.9	14.8	10.2	0.0	3.9	0.0	5.5
			Adolescence				
Happiness	9.4	12.5	3.9	5.5	3.9	3.9	0.8
Unhappiness	7.8	18.0	2.3	0.0	2.3	13.3	12.5

Just how this operates is best illustrated by quotation. One girl describes her family situation in childhood in the following words: "*Unhappiness*: Parents disagreeing, misunderstanding each other. Clothes that made me feel self-conscious. Being expected to give things up for a younger brother and sister who left me alone being so close in age, almost like twins." She found compensation in day dreams, school success, understanding aunts, and in "finding grown-ups to be fond of". Not unexpectedly, she found social adjustments a difficulty in the 'teens and adds, "Home life does not improve. Nowhere to work—still quarrelling between the other four members—too much interference, too little freedom, clothes, money. Attempts that seem to be intended to keep me from many friendships that might have been. Home is a lonely place where I would rather not spend time except that there I have what belongs to me gathered together."

In such cases, friction in the 'teens seems inevitable and parental disagreements, ranging from mild bickering to prolonged and angry scenes are fairly frequently mentioned.¹ But a happy, united home may also become difficult in the 'teens. One girl, who says of her childhood that everything connected with her family and home gave her happiness, writes thus of her feelings later: "After the age of 14–15 I wanted to be free. My parents seemed to be too strict, although looking back I suppose it was necessary. I wanted to go out with boys and have nice clothes. I suppose I was silly and irresponsible, but I felt I was being unfairly treated, compared to other girls. I wanted to wear make-up—which of course was not allowed. . . . I hadn't much interest in home life. It is only during the last year that my real love and companionship with my parents has come back." Another girl, the circum-

¹ Among the very many studies, some biographical, others by questionnaire methods leading to quantitative results, there is a fair measure of agreement that homes which are antagonistic to the group—school, college or university—to which the youth belongs, which are interfering or clinging, given to chronic dissension, over-religious or narrowly moral, are liable to provoke conflicts and delay adequate adjustments in their adolescent children (see, for example, Pressey(21), Blos(15), Partridge(22)).

stances of whose childhood were happy, mentions the difficulties that arise over studying at home. Others speak of parents who "laugh at ideals and aspirations", who refuse to take their daughter's religious conversion seriously, who are over-ambitious and treat their children to "constant nagging lectures that I should take full advantage of the chances that I had had", or who "were not sufficiently interested to come to Speech Day when I had my School Certificate. It didn't matter how many Speech Days they attended after that." Sometimes the clash is less dramatic, as in the case of the girl who writes: "Unhappiness was caused at certain periods by my mother who, I felt, never understood me. She was an extremely good mother in many ways but we never seemed to get on together and I never had confidence in her to tell her anything of my doings."¹

Another feature of these records is the decline in the 'teens of the numbers who mention their brothers or sisters. In childhood there are frequent mentions of happiness caused by devotion to an older brother or sister or to being one of a large family of children. Unhappiness seems to have been caused by such things as "being forced to take my brother (4½ years younger) with my own friends" which "gave me a dislike of him which has since become permanent". Another girl refers to the pleasure of going to a relative for a holiday "where I could relax from being the eldest of a family and be just whatever I liked". Yet another writes: "My eldest sister was very good at housework and practical things, which she enjoyed. She also had certain privileges, being older, and I was jealous of all this. My brother (six years younger) had a great deal of attention being the 'only son and heir' and also having been very dangerously ill at an early age—so I felt on the whole unwanted." This same girl in her 'teens speaks of "getting to know my father better and also my brother after his return".

Another striking change is brought out by Table 4 and perhaps affords the best evidence of the way in which home ceases to be all in all in the 'teens. Whereas toys, treats, holidays, Christmas, birthdays and the like are mentioned by one-third of the group as a source of childhood happiness, only 5.5% of the group mention such things as of importance after the age of 13. Partly, the restrictions which wartime placed upon holidays may account for some of this; but one cannot escape the conclusion that adolescent girls of this social and intellectual level find a less keen pleasure in family celebrations.

At both periods, with small proportions of the group, relatives play a part which is, on the whole, productive of happiness. Some mention visits to grandparents and aunts in the country, others the attention paid to them in their 'teens by bachelor uncles. Causing unhappiness is the presence of relatives in the home with its effect upon relationships between the parents.

¹ Elsewhere ((10), chap. II) the present writer has given some evidence of the causes of friction between parents and their adolescent children derived from groups of young workers. Partridge(22) cites figures derived from the Lynds' *Middletown* ((23), pp. 205-7) to show that American adolescent girls report disagreement with their parents on the number of times they are allowed to go out; the time they get in at night; school progress; use of the family car; pocket money; boys or girls chosen as friends; going to unchaperoned parties; and the way they dress, home duties and Sunday observance. Allowing for differences of culture pattern, the picture is very much the same as in the present group and suggests that the bid for independence in the 'teens will be made, whatever the surrounding social conditions. Blos ((15), pp. 237 ff.) points out that the situation is complicated, sometimes very markedly, by parental attitudes and by unresolved conflicts in the parents' own emotional life—"Parents are inclined to solve the child's problems in terms of their own particular experience and in terms of the proverbial misunderstanding between the generations" (p. 239). On the psycho-analytic interpretation of this phase, cf. Flugel ((24), pp. 174, 207-8).

There is, as one would expect, an increase in the numbers of those who experience sorrow through the death or serious illness of a parent or relative in the 'teens. The effect of such experiences is difficult to estimate but it may have some connexion with the mentions of fear of dying which, in this group, occur only in the 'teens (see the later discussion of the *miscellaneous* section). In one case, the death of a father, while it caused sorrow at the time, lifted a weight from the mind of the girl and from then forth her school work rapidly improved.

(b) *School and university*

In discussing Table 3, it was pointed out that for many girls, the wider world of school and, later, of the university, tended to overshadow the home environment in importance in adolescence. Table 5 sets out the proportions of those who mention various aspects of school and university life.

Table 5. *Percentages of the group referring to particular aspects of school and university life*

	School and university in general	Staff	Academic study	Discipline	Examina- tions
		Childhood			
Happiness	28.2	3.1	4.7	0.0	0.0
Unhappiness	7.8	5.5	1.6	0.0	0.8
		Adolescence			
Happiness	35.9	4.7	10.2	0.0	0.0
Unhappiness	10.9	6.2	10.9	4.7	9.4

As one would expect, most of these girls, being higher than average in general ability, enjoyed their childhood schooldays. Of the few who did not, most state that any unhappiness was transitory and usually caused by "worrying over little things at school—e.g. knitting lesson because I couldn't do it"; or by "arithmetic and spelling"; or occasionally by an unsympathetic teacher. With the 'teens come clashes with the restrictive discipline of school, taking the form either of an anxious fear of doing wrong or of angry revolt. "School with its hundred and one rules", writes one girl with feeling; "I lived in perpetual fear of breaking one. There was a summer rule that unless it was actually raining when we set out from home, we were to come in panamas. One dinner time, urged by my mother, I put on my velour hat and when I arrived at school, I said that it was raining when I left home. However, this was checked up from one of the prefects who came from my district and I received a disorder mark, which was really nothing at all but seemed the height of disgrace." Another girl reveals the angry protest of the developing personality when she writes of "the strict, petty rules of our school, never ceasing from the moment we got back, till we steamed out of the station on the train. . . . Until the age of 15, I was very happy at school and in fairness to the place I must say that my unhappiness was probably my own doing. I'm essentially an individual and hate conforming to unnecessary restrictions and being moulded on the same lines as 150 other girls." One girl reports that "about the age of 14 I became very critical of school, but as the headmistress tried to make things better by suggestions, I soon got over it". Many speak of "having too much homework and not being able to get through it in reasonable time". "Homework was given which took us all hours to do and then often we were told it was badly done (the boys copied and had good marks). Only thing drilled into us was passing School Cert. and I had several illnesses. I was nearly top of the form, but did not enjoy school very much as tests were given us every day." A few mention the weight of responsibility in being a prefect or head girl.

References to life at the university are happy on the whole. "I have been very happy here", writes one girl, "where I have been much freer in many ways than at home where the whole neighbourhood censured one's actions since my family kept themselves very much apart and where few of the young people are educated or interested in education." "Being at University", says another, "and being away from home has given me what I wanted—freedom of expression and emotions. I have enjoyed the feeling of responsibility and independence and the feeling of increased power of attraction and popularity, especially with the opposite sex." There are some who find leaving home and making friends at the university difficult—"As I do not make friends easily, loneliness is a present cause of unhappiness." "Coming to University has been a mixed experience—interesting work, but difficult socially." A number mention the love of their academic studies as a compensation and a refuge. "Very great love of my main subject overcame any unhappiness which I might ever have experienced temporarily—I seemed as though I could just escape from the world while I was working at it." Others find that even at university, pressure of work cramps their activities. "I am not satisfied with the present arrangement of work. Many interests have been lost through lack of time to follow them up. I think there is great danger of losing interest in many subjects which might have caused great pleasure." A few mention, specifically, valuable friendships with school or university staff which compensate for difficulties at home or in adjusting to contemporaries.

(c) *Physical environment*

References to the physical environment are few in childhood (10% of the group) and all, save one, refer to the delight of moving to or being brought up in the country. "I lived in the country and had plenty of interesting places to play in such as an old summer house, fields and some undergrowth in which we could hide." Change of family residence is mentioned in the 'teens. "From living in town, we moved to the verge of the country to which we all belonged and loved. For four years I lived in the depths of the country and this gave me great experience and pleasure and I learned to become country minded." The principal factor in the 'teens is the change of environment brought about by evacuation and the exigencies of war. For most who mention it, it seems to have been at the best a mixed experience and on the whole unhappy (16.4% of the group mention unhappy experiences connected with evacuation and only 5.5% mention happy experiences). "The first year of evacuation", writes one girl, "I was not happy till the end. I had seven different billets mainly with old people some of them over 80 years. Finally I was put with my sister in a good billet and was happy." For some few, however, it was a wholly delightful experience: "I lived in a hostel for eight months and was very happy there. There were six of us who were usually together in the evenings, differing in race, religion and in many other ways. We had discussion on many topics, usually religion, and I enjoyed them very much."¹

¹ M. D. Vernon (25), studying a similar group under evacuation conditions, found that opinion on the advantages and disadvantages was fairly evenly balanced with, however, a general slight preponderance of those mentioning difficulties. Rather more than a quarter spontaneously made remarks indicating home-sickness, and 42% mentioned missing friends and familiar companions. Straker & Thouless (26) report a sharp rise after age 13 in the percentages of children unsatisfactorily adjusted in foster-parent-Child relationships. Keir, reporting on Central school children of both sexes aged 10-14 + (27), notes that the girls were more keenly aware of immediate relationships and showed less thought for those at home than the boys, and that the girls' responses—especially those of the older girls—were more highly coloured emotionally than those of the boys. The subjects of the present study would have been between 12 and 14 in 1939-40, and evacuation for most would therefore have coincided with the early, somewhat difficult phase of the 'teens.

A small proportion (5.5%) refer specifically to a new delight in nature arising in the 'teens. "Happiness caused by being in the country—especially hilly country", writes one; and another speaks of holidays on her grandfather's farm which brought great happiness—"the peace, quietness, lonely walks, and the countryside itself".

This figure is strikingly lower than that obtained in questionnaire surveys. Among his women students, Valentine finds that two-thirds report an increased interest in nature in the 'teens, while Wheeler records that 57% of her women students and 62% of her women workers report similarly. In my own rather younger groups of working girls the figure is 40%. This very striking difference cannot be attributed solely to the fact of a specific question on the point being put in the questionnaire surveys and not in the present one. It suggests rather that whereas an increased interest in nature is a feature of the 'teens, the number of adolescent girls of the type under discussion to whom nature is a *major* source of emotional stimulus is comparatively small. This is, I think, a very significant point, not merely in speaking of this one aspect, but in any general consideration of the social, intellectual and emotional changes of the 'teens. We know a good deal about the changes in direction of interests and pre-occupations during the adolescent years but we know little enough of the hierarchy of importance of the various emotional fields in the lives of individuals.

(d) *Social relationships*

That this is so is strikingly borne out when we come to consider social relationships outside the family group. Upwards of two-thirds of Valentine's(8), Wheeler's(9), and my own groups(10) studied by questionnaire, report increases in the 'teens in interest in social activities, group games, the opposite sex, and the formation of important friendships. Such data, while they indicate the spread within groups of all types of interest in social relationships, do not indicate the intensity or the feeling tone with which they are invested.

Table 6. *Percentages of the group referring to particular aspects of social relationships*

	Friends	Loneliness	Social contacts	Love affairs	Social aspects of the self
Childhood					
Happiness	25.0	0.0	3.1	0.0	0.0
Unhappiness	0.0	6.3	6.3	0.0	7.8
Adolescence					
Happiness	25.5	0.0	10.2	11.7	3.9
Unhappiness	5.5	9.4	9.4	5.5	19.5

Table 6, which presents the enumerative data from the present survey, suggests that the change is more subtle than might at first be thought; but it does not by itself bring out the most striking of the differences, which are qualitative rather than quantitative. For example, there are almost as many girls who mention the companions of their childhood as there are who mention the friendships of adolescence, but there is a great difference in the tone of the mention at the two periods. Most of the references in childhood are in general terms—"the companionship of other children", "my best friend came to live next door", "numerous school friends". Moving to a new district and having to make new friends occurs several times as a cause of temporary unhappiness. Loneliness is complained of by a few, mostly only children whose longing for brothers and sisters is unsatisfied. The mention made in the 'teens is much more highly charged emotionally, particularly to

friends. Friendship takes a more mature and devoted turn. One girl writes of the dazzling discovery of another personality—that of a girl to whom she had been indifferent previously: “I had a most extraordinary desire to know her well. This appeared to be mutual. We had great fun together and knew each other in a way which was more than friendly, consequently I am more fond of her than I have ever been of anyone, even my parents, whom of course I do like. But as this friendship is very real, I do not think it right to write down any more about it. It is between her and myself.”¹ Such friendships are often fiercely possessive and the burning rods of jealousy are keenly felt. “Friends are predominant in both categories” (happiness and unhappiness), writes another girl, “because they played such an important part in my life. The main reason for their inclusion as a cause of unhappiness was due to the fact that very often friends for whom I felt an intense affection failed to return it in the same degree. From 14–18, I was extremely possessive and wanted one friend who would centre all her affections on me—I was very jealous of anyone else for whom she showed any affection and would make myself utterly miserable by imagining she did not return my fondness or that she liked other people more than myself. . . . This applies only to female friends. With regard to males any happiness or unhappiness has been much less pronounced and has been largely caused by the relative certainty or instability of my own feelings.”

Compared with the importance of friendships in the 'teens, heterosexual relationships achieve fewer mentions. Some of this may be ascribed to a natural reticence but more, probably, to the age and social background of these girls and their comparatively sheltered life prior to coming to the mixed society of the university. Some mention transitory happiness or unhappiness in boy-girl affairs in the early 'teens: “from the age of 13–14 boy-girl relationships have played a large part in my life—caused me a lot of happiness and rather a large amount of bittersweet melancholy when I got into such a mood that I felt like reading poetry and writing it too! This usually helped me considerably.” Others mention unhappy affairs—“Relationships with the opposite sex on the whole unhappy—either ended by the other person or in one case have been more or less ignored”, says one; and another, “My first love affair ended in a crash after which I lost all faith in men and was unhappy for months”; and another speaks of a happy love affair marred by unhappiness over “problems of unworthiness”. But the impression is on the whole a happy one; as a source of present happiness one girl names “my present even emotional state . . . having found a member of the opposite sex for whom I have a deep and satisfying affection which is reciprocated”; and another speaks of “a deeper religious understanding” achieved through her relations with her fiancé.

In other more general social contexts there are changes, but they are increased in the numbers mentioning them, rather than qualitative changes of the kinds described above. After the age of 13 many more of these girls mention adjustments to others, the pleasure of being with a group, reflexions upon their own personal or social adequacy or inadequacy. In childhood one finds mentions of “not being able to dance, recite or sing”, and “not liking to do things with other children much and I never had any desire for parties or to go to other children's parties”, and of “being very shy”. One finds too that “clothes that

¹ To such emotional friendships there are many parallels in literature and in real life (cf. Hogg and Shelley, for example; and Jane Austen has made gay fun of them in *Love and Freindship*). Iovetz-Tereshchenko's study of adolescent letter and diary material ((28), pp. 70–4) records one fine account by an adolescent of the first swift dawn of such an attachment.

made me feel self-conscious, hatred of long black woollen stockings" are spoken of as causes of discontent, while pleasure is derived from "acting and wearing pretty clothes". In the 'teens similar things occur. One girl speaks of her hatred of having to tie her hair back in a tight knob; another worries about being too plump; another mentions a scar on her lip; another, her fear of "being socially rejected through physical unattractiveness—self-pity resulted", and another "Looks—round shoulders, lank hair, figure, first too fat and then too thin". There are several who mention "Lack of confidence, not knowing how to behave, not having anything fit to wear... hesitant about etiquette, clothes, meeting people and going places", and worries as to "whether a visit was welcome or inconvenient". Some mention general difficulty in adjustment to contemporaries "fear of meeting new people—what to do or say"; while others rejoice in "meeting new sorts of people up here and being liked and made happy". One thing which occurs during the 'teens and is not mentioned in childhood is a discrepancy between the standard of one's own home and that of one's friends. "Living in a small house and having friends who were in a financially better position." Many rejoice in such social activities as Youth Clubs, Guides, Harvest Camps, Young Farmers' Clubs, Church Guilds and the like. In general, the picture is not so much of change as of a heightened social responsiveness and a heightened awareness of one's own personality in its social aspects, the distressing side of which is well summed up by a girl who writes: "Awareness of other people faced with the same problems and situations as myself, and their apparent ease when handling these situations—when I was confused and *always* so uncertain myself—gave me the feeling of being different."

(e) *Games, sports, hobbies and interests*

In the mention which is made of games and sports, hobbies and other interests there is evidence of an intensification in activities of all kinds in the 'teens and seldom indeed is there mention of unhappiness. One girl mentions that, in learning to play the piano in her childhood, she hated "scales, especially in a minor key" and another feared ridicule because of her clumsiness at outdoor games. For the most part, the references are to "increasing physical ability and enjoyment of exercise" after the age of 13; to "swimming", "cycle riding and tennis playing in the heat of the summer", or to "being put in the first hockey team".

Among more cultural activities, one girl writes emphatically of an apparently genuine aesthetic experience in childhood—"My first visit to the Ballet gave me intense happiness (*not* pleasure). I've remembered it to this day. Music made me happy, possibly because I connected it with my father who taught me to listen to it." Music is mentioned increasingly in the 'teens and always as a much-loved source of happiness (4.7% in childhood; 11.0% in adolescence), and not infrequently as a compensation for unhappiness in other directions. Others speak with regret of the curtailment of time spent on music by homework—"I continued with the violin in spite of homework", writes one, "but I could not practice very often."

The expanding intellectual and emotional life spills over in other directions in the 'teens—"Books, pictures, etc., have given me great happiness", says one, "I like collecting such things." Another writes, "In recent years I have gained an almost unaccountable abstract pleasure from hitherto unnoticed things—cathedrals, nature, and so on. This all helped to combat the feeling of uncomfortableness I felt in an alien crowd of people." Some are

catholic in their activities and tastes—"Anything to do with animals, birds, flowers, music, gymnastics and dancing, etc., and embroidery all gave me great pleasure."

This evidence concurs with that presented by Valentine (8) and by Wheeler (9). It points to the conclusion reached by Margaret Phillips (11) that the 'teens show an all-round increase in emotional energy which leaves a surplus available for genuine aesthetic experience and for the formation,—partly on the basis of increased intellectual power and partly on the basis of greater emotional maturity—of genuine and complex sentiments for all forms of art. Physical and intellectual activity too, it should be noticed, are a field in which self-expression or self-forgetfulness can be attained with little reference to the pressing problems of adjustment to others; they are therefore well adapted both to absorb surplus energy and to provide a temporary refuge in times of stress.

(f) *Personal future*

In as highly selected a group as the present, the majority of whom are training for a career of their own choice, one would expect to find less vocational uncertainty than in a more miscellaneous one. A number, however, do mention their delight in being able to take up teaching or speak of a brief period during which they tried something else and did not like it. Of the latter, a typical example is the girl who writes—"After leaving school at the age of 17 years 7 months, I began work and left home to do so. At the end of three months I left this occupation, and there followed a period of great worry, because I was of calling-up age and had no work. In January of the following year I began teaching in a junior school, and after the first few months of settling in and finding my feet I became quite happy and have been so more or less since." Some, to whom teaching is obviously second best, mention frustrated ambitions—"I was happy until about sixteen when, due to unfortunate circumstances, I had to give up the work I loved. The work I do now is really second best, although I like it very much." Others experienced a period of uncertainty before they settled on teaching—"not being able to discover a career that would really suit me, worried me, especially at the end of school years." Such uncertainties and disappointments are mentioned by 9.4% of the group, nearly 4% mentioning their satisfaction in their present choice.

(g) *Miscellaneous*

In very many respects the types of experience which are classified in this miscellaneous category are the most interesting of all. Numerically the most important topic mentioned here is religion which is spoken of, either as a source of happiness or of unhappiness, by 13% of the group in adolescence.¹ Only just over 2% mention it in connexion with their childhood. Though religion is cited predominantly as a source of happiness, there seems to be a wide variety of experience. One girl writes: "At the age of twelve, I was converted to the faith in the Lord Jesus Christ and since then I feel that my life has been really worth

¹ There seem to be wide differences of opinion and of evidence on the incidence of religious conversion and religious interest in the 'teens. Earlier writers from Starbuck onwards insist that genuine religious experience is a widespread feature of the 'teens. The figures given by Valentine and Wheeler show that between half and three-quarters of their groups report religious experience at adolescence, though *conversion* is mentioned only by rather more than a quarter of Wheeler's groups. This evidence was gathered before 1930. Cole reporting more recent studies of American groups ((7), pp. 166-7) states that the *majority* of adolescents have no religious doubts (and little deep religious experience) at any time, a conclusion which concurs with the findings from the present group, and from the group of adolescent workers described in (10), chap. v. It is probable that we have here evidence of a genuine change in the psychological atmosphere, though it is possible that the differences commented upon are more a product of the methods of gathering the figures than genuinely corresponding to an underlying change in the last two decades.

while... It seems to me that other things can and do give happiness for a certain length of time but that a living faith provides a wonderful security and joy which does not change with circumstances." With two of the group, religion is associated with a happy love affair—"The person who is now my fiancé and who has brought me to know and love Christ" writes one, of her happiness; and the other expresses herself in similar terms. On the other hand, religion may provoke problems. One girl speaks of joining the Christian Science Church which "added to the problem of marriage". Another writes: "I began to think more about religion—it causes headaches, especially after my brother was killed." In the home situation, too, religion may bring problems of which one student speaks with shrewd insight: "At about the age of thirteen, I began a religious phase which caused a great deal of emotional upset. It caused me at times to feel very happy in a self-righteous way but also made me at loggerheads with my parents who either failed to understand the phase or deliberately laughed at me. When I wasn't feeling self-righteous, I felt as if I was the laughing-stock of my friends. The phase lasted until I was about 14½ when I dropped religion like a hot brick and became almost antagonistic towards it."

The other references grouped in this category are more truly miscellaneous. In childhood 10% of the group mention such things as fear of the dentist, attacks of car sickness, "being excitable and nervy" and "being sick with excitement". Similar, but vaguer and more abstract things, occur twice as frequently in the 'teens—swings of mood, "sometimes sublimely happy, sometimes cast into the depths of despair for no apparent reason", excitability, and so on. One such deserves a special mention since it does not occur in childhood, the mention of fear of death¹ which is put most vividly by the girl who writes—"At the age of about 14 years, I experienced an uncontrollable fear of death which caused me some unhappiness. Living away from home added to this because I couldn't talk to anyone older. I remember distinctly deliberately finding people out and asking them what they thought of death." Others mention that "growing up was a sore trial" and two speak of "great difficulty in reconciling the ideals of literature and religion with ordinary life", and "a growing awareness that people I loved and respected were fallible human beings after all." Only one girl, surprisingly enough, writes of "being greatly depressed by events such as the revelations of the Belsen horror camps and by the prospect of future war using the atom bomb". One expresses her conflict in more general terms: "Happiness or unhappiness does not always depend upon specific events etc., for me, but by being put off by thoughts of the future, general lack of faith or on the other hand confidence in life in general. Unstable, no fixed outlook."

IV. CONCLUSIONS

The data here presented in their quantitative and qualitative aspects vividly illuminate two main periods of development, childhood and adolescence. They suggest that the second period cannot be regarded as distinct from the first but as emergent from it, a deepening and widening and, in some sense, a repatterning of the emotional field.

¹ The preoccupation with death shown by some adolescents is probably—as Hollingworth suggests ((2), p. 188)—partly a product of experience. By the time the 'teens have been reached there is more likelihood that someone intimately connected with the youth will have died. Deutsch ((29), pp. 175 ff.) suggests that in girls fear of death is connected with fantasies of pregnancy and with ambivalent attitudes towards the mother and elder sisters; this, however, does not explain the occurrence of similar preoccupations in adolescent boys. It seems likely that it is only with increased intellectual and emotional maturity that death can be apprehended imaginatively and the growing sense of individuality and personality makes the threat of extinction fuller of meaning.

In childhood, the family group is all important and the experiences which it provides are the major source of emotional stimuli. By its very universality in our civilization, it imposes a certain uniformity on childhood experiences, at least among those from roughly the same socio-economic level. Its only rivals in importance are the world of school and the society of other children in the immediate neighbourhood of the home; and even here some limitations are imposed by family circumstances and by the more or less uniform educational experience to which almost all children are subjected at least until the age of 11.

Thereafter one can detect, even in a group as closely homogeneous as this, two major trends of development which, interacting with each other, operate to deepen and enrich the personality. The first of these may be called *the growth of self-awareness*. Few of the experiences reported from childhood betray a conscious conception of the self in any complex sense; in contrast, most of those related to the 'teens are tinged with an acute awareness of personal identity and uniqueness, of the enjoying, experiencing, social self. The second trend may be ascribed mainly to *environmental and cultural conditions*; it is a product of what parents, society, and contemporaries expect of the adolescent. For most, even for those whose lives are comparatively sheltered, there is a steadily enlarging scope of activity—at school, and in social and intellectual contexts; and, coupled with this, a markedly increased idiosyncrasy of experience and reaction. The comparative uniformity of the childhood milieu gives way to a divergency so marked that generalizations and assumptions which can be risked in childhood, are almost valueless when applied to individuals—even of the same sex and social group—in their 'teens.

How far these two trends are superficial evidence of more complex underlying psychological changes it is not possible to determine from the data at our disposal. Doubtless many factors—greater physical strength and range of movement, the attainment of sexual maturity, and the growth of intelligence—affect the matter both directly and by increasing the range of individual difference. Our data do, however, throw some light on how the personality emerges from childhood to adolescence, and on what are the emotional accompaniments of the change.

It seems clear from the comparative homogeneity of the group under discussion that presence or absence of conflict in the 'teens cannot be assigned in anything but the broadest sense to a specific culture pattern. Some mention considerable emotional storm and stress; others seem to have passed the years from 12 to 18 or 20 in comparative calm. There is evidence for emotional change, evidence that for some this is a painful process at times, evidence that on the whole the 'teens are more subject to difficulty and unhappy experience than childhood years. There is, however, no evidence that conflict is *inevitable* in any of the fields of development, or under any of the normal circumstances of growth. Still less is there evidence that girls of this intellectual and social level regard the 'teens as predominantly unhappy.

V. SUMMARY

1. 128 young women between the ages of 17+ and 24 in the teacher-training department of a university were asked to complete a schedule on the causes of happiness and unhappiness in childhood and adolescence.

2. 81.6% of the group rated themselves as happy both in childhood and in adolescence. Less than 8% were unhappy in childhood, less than 12% in adolescence.

3. Whereas two-thirds of the recollections of childhood are happy ones, only just over half of those from the 'teens are happy. This difference is fully significant statistically and points to an increased emotional stress in the 'teens.

4. There are indications that the early 'teens are more difficult than the later.

5. There is clear evidence that, for girls of this type, the importance emotionally of the home and family situation declines in the 'teens and wider social environments such as school and university become more significant. In the references to the family there is a qualitative change; there is more mention, in the 'teens, of conflict and difficulty at home and in particular there are significantly more who mention clashes with their parents and with the restraints of home discipline.

6. In the references to friendship there is a striking qualitative difference after the age of 12 or 13.

7. In general social relationships the picture is of widened scope, heightened responsiveness and increased self-awareness in the 'teens rather than of change.

8. Games, sports, hobbies and intellectual interests of various kinds seem at both periods to offer a refuge when life is proving difficult, as well as an outlet for superfluous energy. The number of times these are mentioned is slightly greater in the 'teens than in childhood and the qualitative difference fairly marked, indicating the overflow of physical, emotional and intellectual energy into many channels.

9. There is no evidence to suggest that storm and stress is an inevitable accompaniment of development in the 'teens or that, when it occurs, it is necessarily a product of the culture pattern.

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THE USE OF ARCHAIC LANGUAGE IN RELIGIOUS EXPRESSION: AN EXAMPLE OF 'CANALIZED RESPONSE'

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I. *Introduction* (pp. 209-210). II. *Method* (pp. 210-211). III. *Discussion of quantitative results* (pp. 211-213). IV. *Discussion of subjects' statements* (pp. 214-216). V. *Implications for research* (pp. 216-217). VI. *Summary* (p. 217). *References* (p. 217).

I. INTRODUCTION

In studying the association of stimulus and response in such phenomena as habit formation, a relationship is commonly assumed whereby, when we are first confronted by a situation; our responses to it may be of many different kinds, but if over a period we meet the same situation repeatedly, our responses become less varied and tend to fall into a stereotyped pattern. Stating this more formally, we may say it is commonly held that a stimulus pattern which originally was capable of producing a number of different types of response pattern, comes in course of repetition to elicit one only. This response pattern may, however, continue to be evoked by other stimulus patterns, so that the constraint implied in the association must be thought of as being upon the potentialities of the *stimulus*.

The complementary relationship in which a response pattern, which originally was given to a number of different types of stimulus pattern, comes in course of repetition to be given to one only, so that the constraint must be thought of as being on the attachments of the *response*, appears to have been less well recognized. It seems, however, to be descriptive of a number of very common and important psychological phenomena, such as that adults tend to eat only at appointed times and with conventional appurtenances, although very young children treat as 'food' a great variety of objects in many different circumstances. It also bears some similarity to the patterning of the 'differential inhibition' described by Pavlov (3), pp. 117 et seq.), and seems to contain the core of the relationships termed 'canalization of response' by Murphy, Murphy & Newcomb, although in their discussion it is somewhat confused with other concepts (2), pp. 190 et seq.).

It is important to remember that such patterns of association do not provide an *explanation* of the phenomena, but merely give a systematic *description* of relationships. It is true that many attempts have been made to link neuro-physiological explanations to such descriptions, for instance, the neural mechanisms postulated to account for conditioning, but the existence of an association and much of the usefulness of a systematic description of it are not dependent on the truth or falsity of any particular underlying mechanism which is postulated to explain it. The factors producing the association are almost certainly extremely complex, but the end product of their interaction may still often be usefully described in relatively simple terms. In doing so we need, however, to exercise considerable caution and to realize that our simplification, while it brings the phenomena into a form in which they can be handled, inevitably obscures some subtleties which, although not of immediate importance, may eventually have to be taken into account. The statements in this paper should be considered with this precaution in mind.

The preference for archaic language in religious services and sacred books has been widely regarded as being due to 'habit formation', with the further assumption that this follows the pattern in which the response to a particular stimulus becomes stereotyped. In other words, it is assumed that people who frequently hear archaic language in religious services have a greater tendency to like it than have those who do not hear it so often. The results of the experiment described here suggest, however, that this preference for archaic language in religion is better regarded as an example of a constrained or 'canalized response'. The experiment was designed to study the liking for the Biblical type of language in prose material, both religious and secular, among groups having different degrees of church attachment, and is an extension of an earlier study on the use of the liturgical type of language in prayers (4).

II. METHOD

Prose passages, about a hundred words long, of the following five classes, were taken from the Bible and various seventeenth-century authors:

- (a) Well-known Biblical passages.
- (b) Less-known Biblical passages.
- (c) Non-Biblical passages, but religious in tone, and making reference to the Deity.
- (d) Passages of a type similar to (c) but not making reference to the Deity.
- (e) Secular passages of a more mundane nature.

The five classes were intended to form a series in which the degree of attachment to religion decreases with each class from (a) to (e). It is not, of course, assumed that there are 'equal appearing intervals' between the classes.

A version in modern language of each passage was prepared in such a way as to convey the meaning more clearly, but in language of a poorer literary quality than the original, so that the two versions reproduce the contrasts normally found between the Authorized Version and modern translations of the Bible. In order to be reasonably sure that the original was in fact of higher literary quality, and the modern version more easily understandable, the two versions of each passage were given to five observers, and a pair of passages was accepted for further use only if all five agreed that it met both requirements, or if four so agreed while the fifth regarded it as meeting one of the requirements but as equal in respect of the other. To enhance the generality of the results, four different but parallel sets of passages were built up, each containing one pair from each of the five classes. The pairs of passages were duplicated on slips of paper with the originals above and the modern versions below. The biblical passages were marked with their chapter references to make them clearly distinguishable as such.

The sixty subjects—twenty clergy and ordinands, twenty lay churchgoers and twenty non-churchgoers—were all male students or younger faculty members of the University or Theological Seminary of Princeton, U.S.A. Because of an earlier finding that association with youth work seemed to influence the choice of language for prayers (4, p. 62), those who were or had been youth leaders or school teachers were excluded. In view of the nature of the material, those who had not been brought up in the United States or whose major subject of study was English literature were also excluded. Arts and science students were almost exactly balanced as between the lay churchgoing and non-churchgoing groups, but it was inevitable that there should be some bias (although it appeared to be unimportant) in favour of arts students among the clergy and ordinands. The three groups of

subjects may thus be regarded as approximately similar, except in degree of church attachment. Differences in this respect imply different amounts of 'practice' or different numbers of 'trials' with Biblical language, the clergy and ordinands having most, the lay churchgoers being intermediate, and the non-churchgoers having least.

Each subject was given one of the four sets of passages and asked to mark the member of each pair which he preferred, the grounds of his preference being left to his own choice. Having done this for all the five pairs of passages in the set, he was asked to go back and state the reasons for his choices. Finally, he was asked to mark any of the passages familiar to him. In allotting sets of passages, each of the three groups of twenty subjects was divided into four blocks of five, and a different set was given to each block. The order of presentation of the classes of passage within each block was such that the classes were arranged among the individual subjects in the form of a 5×5 Latin square, so as to minimize order of presentation effects.

III. DISCUSSION OF QUANTITATIVE RESULTS

It is convenient for purposes of discussion to divide the results into two parts: first, the quantitative data regarding the preferences of the different groups of subjects for originals and modern versions of the various classes of passage; secondly, the reasons for choice given by the subjects and their statements regarding familiarity. The first provides the material for a general systematic description of relationships of the kind discussed in the Introduction, the second provides a more detailed view by showing some of the conscious accompaniments of the complex factors lying behind these relationships.

The numbers of times the original versions of passages were preferred to the modern are shown in Fig. 1. As previously mentioned, no assumption of equal intervals between the classes is made. Three features of the 'curves' in this figure seem worthy of comment:

(i) All three curves show a downward slope from left to right, indicating that in all the groups there is a positive association between preference for the original version of a passage and religious subject-matter. In other words, all the groups of subjects show a decreasing tendency to choose the originals as they pass from the most religious to the least religious classes of passage. This finding is consistent with the hypothesis that liking for Biblical language is due to 'habit-formation', and is not unexpected in view of the fact that by far the commonest context for the type of language used in the originals is a religious one, and even non-churchgoers have some acquaintance with religious services and writings.

(ii) The clergy and ordinands show a greater tendency than do the lay churchgoers to choose the originals of the definitely religious classes of passage, (*a*), (*b*) and particularly (*c*). This relationship is what would be expected from a habit-formation involving an association belonging to the first of the two types mentioned in the Introduction, in which the range of responses to a given stimulus pattern becomes restricted. It suggests that the clergy and ordinands, because of their closer acquaintance with the Bible, Prayer Book and other religious literature, are more likely than the lay churchgoers to prefer the Biblical type of language for religious material.

(iii) For the non-Biblical passages (*c*), (*d*) and (*e*), the non-churchgoers' curve is higher than that of either churchgoing group. This clearly cannot be due to the type of association in which the range of response to a given stimulus pattern becomes restricted. For if this process was operating to differentiate churchgoers and non-churchgoers, the former should

show a greater tendency than the latter to prefer the originals of religious passages; so that the curves for the two churchgoing groups should be higher than the non-churchgoers' curve for the religious classes of passage, and slope gradually downwards to equality with the non-churchgoers' curve for the non-religious classes of passage—a form very unlike that of Fig. 1. Nor can the discrepancy between the churchgoers' and non-churchgoers' curves be due to some overall difference between the groups, such as greater appreciation of literary quality by the non-churchgoers or of clarity of thought by the churchgoers, for in either of these cases we should expect the separation between the groups to be consistent for all classes of passage, which it is not. It is just possible that the separation is due to higher literary appreciation among non-churchgoers combined with restriction of the range of response evoked by Biblical matter in churchgoers (i.e. a combination of the two possible factors discussed so far); but this is very unlikely, since even the clergy and ordinands, who contain a higher proportion of arts students than either of the other groups and who might therefore have been expected to have some bias in favour of literary quality, prefer original versions less frequently than do the non-churchgoers. It is also improbable that the differences are due merely to greater stress by the churchgoers on clarity of meaning together with better understanding by them of Biblical language, since facility at interpreting Biblical language should have assisted them in the non-Biblical passages also, and have led to the curves running parallel and coming more or less to coincide.

The relationships between the churchgoers' and non-churchgoers' curves may, however, be fitted satisfactorily into the pattern which Murphy, Murphy & Newcomb have called 'canalized response'. It appears that the churchgoers' greater acquaintance with Biblical language has not led to any increase of tendency to prefer this language for the Biblical passages, but has resulted in a decreased tendency to prefer it for the non-Biblical. In other words, the response pattern of liking for the Biblical type of language used in the original versions of the passages has, for churchgoers, tended to become confined to stimulus situations in which this language is used to express Biblical matter, while for non-churchgoers, whose acquaintance with the Biblical and liturgical mode of expression is less, the liking for this type of language is more widely spread. Ideally this process should lead to the churchgoers' and non-churchgoers' curves coinciding for Biblical passages, and to the former falling gradually more and more below the latter as they pass to non-religious passages. The actual curves in Fig. 1 may be seen to approximate closely to this pattern. This hypothesis requires that the association between churchgoing and choosing the modern versions of the non-Biblical passages should be significant. The figures of Table 1 show that this requirement is satisfied.

As suggested earlier, these results bear some similarity to those obtained in Pavlovian differentiation. Pavlov's dogs, and many other subjects of conditioning experiments after them, have, when trained with a particular conditioned stimulus, given their conditioned response not only to this but to other similar stimuli, the intensity of response falling off somewhat as the similarity decreases, but remaining appreciable over a wide stimulus range. Training beyond this stage, when carried out with differential reinforcement, has been shown to increase the rate of this falling away. It seems not unreasonable to suggest that in the present instance the Biblical passages represent the conditioned stimulus and the non-Biblical passages the other stimuli, and that while the non-churchgoers show a slight falling away of response to the non-Biblical passages, the churchgoers with their greater degree of 'training' show this falling away to a much greater extent.

We cannot, of course, *explain* the present results in terms of Pavlovian differentiation. Not only do the experimental conditions and task seem to be very different from those of the traditional differential conditioning experiment, but also Pavlovian differentiation required differential reward, and it is not easy to see what this could have been in the

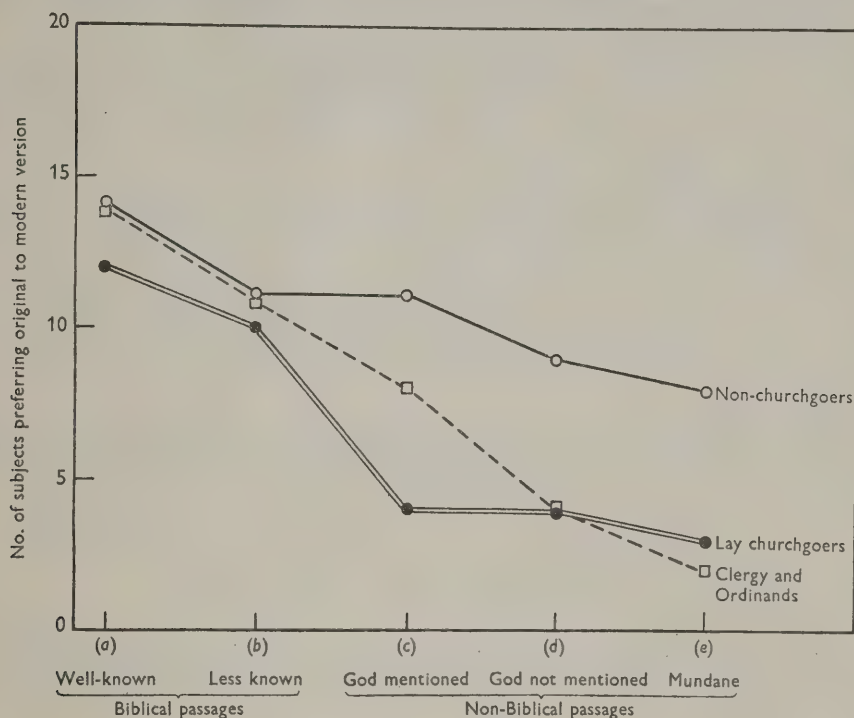


Fig. 1.

Table 1. *The association between churchgoing and choosing the modern versions of non-Biblical passages*

Class of passage		Modern version preferred	Original preferred	τ	P
(c)	Churchgoers	28	12	0.242	0.057
	Non-churchgoers	9	11		
(d)	Churchgoers	32	8	0.262	0.044
	Non-churchgoers	11	9		
(e)	Churchgoers	35	5	0.289	0.019
	Non-churchgoers	12	8		
Mean τ				0.271	0.001

τ and P have been calculated by means of formulae due to Whitfield, who has extended Kendall's coefficient of rank correlation τ to provide a significance test for 2×2 tables (5). This test is free from the disadvantages that attach to the χ^2 test when cell frequencies are low, and provides a considerably more accurate estimate of P than does χ^2 , even when Yates's corrections for continuity are made.

present instance, or indeed how far it is reasonable to apply the term 'reward' to the results of making choices such as those called for here. There is further the basic fallacy of regarding the findings of conditioning experiments as primitive and elemental. To refuse an explanation of our data in terms of Pavlovian differentiation is not, however, to refuse to recognize that they probably have much in common.

IV. DISCUSSION OF SUBJECTS' STATEMENTS

Indication of how some of the factors producing the associations seen in the quantitative results appear in consciousness is obtained from the reasons given by subjects for their choices. It should be noted at the outset, however, that some of the subjects appeared highly inconsistent when their statements about the different classes of passage were compared. While it is easy for an experimenter to misinterpret such remarks, it does seem that in many cases the reasons given were in the nature of *rationalizations* of judgements formed immediately without the subjects knowing why. Additional support for this view was furnished by a few subjects who, while definite in their choices, found it difficult or impossible to give reasons for them.

As was to be expected, the majority of the reasons given were concerned with the factors deliberately introduced into the pairs of passages, that is, archaism, clarity and literary quality.

When the modern version was chosen, it was almost always stated to be, amongst other reasons, because of its clarity or simplicity of expression, greater comprehensibility or 'directness'.

"More clarity in this passage. Stated more positively." "Simplicity of language. Clarity of thought without unnecessary flourishes." "I like the second rendering.... It is easier to understand and more everyday English." "The second is more simple and direct as a statement of advice and counsel. The other has a bit archaic form."

When the original version was chosen, it was usually stated to be because of its finer language, greater literary quality, 'smoothness' or 'poetic quality'.

"The ones checked appealed more in that they had a more poetic quality and were not as cold as was the prose of the others." "Smoother expression; flowing style. However not so positively expressed." "Better 'music'." "Ordinarily I prefer more traditional scriptural terminology which keeps the poetry in theological thought." "The greatest feature of Biblical passages is the literary style and not the precise content. Hence first one preferred."

Over half the subjects stated explicitly a liking for or dislike of archaic language as such in relation to particular passages. Several others also seem to have indicated this without actually stating it, and no subject said that the archaism of the language made no difference at all to his judgements.

As has been suggested, the stress on mode of expression is not surprising, in view of the way the pairs of passages were constructed. The problem is, why was archaism or beauty of language preferred in some cases, and modernity or clarity in others? Many subjects gave no reason beyond a statement of preference for one or other of these features, but many also gave additional reasons which throw some light on this point.

A considerable number of subjects in all groups stated that their preference for the originals of the religious passages was due to their being used to the language of the King James Version (the American name for the Authorized Version). A few who chose the modern version said they probably would not have done so if they had been better acquainted with the Bible.

"Preference here probably purely devotion to King James translation." "My background is such that I cannot think of a Biblical passage in anything but archaic language." "Sentimental, perhaps, or emotional attachment to King James language." "I have preferred the familiar (i.e. modern), and therefore clearer... style in all cases because I can grasp the meaning immediately—because it appears much more fluent and because of the limited punctuation. If I were better read in the Bible, I would probably have chosen the top selection of each set of Biblical passages."

Such terms as 'fittingness' and 'appropriateness' were not infrequently used to describe both the originals of the religious and the modern versions of the secular passages.

"In general I think that one basic line of reasoning governed the choices. It was that some subjects seem more properly treated in the literary style of the top passages, whereas others appear more fitted to the lower type." "Biblical subject or tone of the passage demands a Biblical style." "Its style and language seem more in accord with the subject matter." "Its language is more suitable to a letter of praise." "Being in more modern language it is more suited to one's own thoughts." "Have got used to Biblical style and would not think of reading the Bible in anything other than this. It would seem rather *mundane* to have the Bible written in modern style."

Among the churchgoers, especially the clergy and ordinands, several subjects mentioned the originals as having more 'force,' 'power,' 'dignity' or 'emotional appeal'.

"The passages chosen, I feel, are more elevated and exhibit a higher grandeur and beauty—a quality which is more lasting and enduring. This may be the result of the King James Version upon me as regards the Biblical passages: but in any prose, Biblical or otherwise, the style of writing has a quality which instils more awe and reverence as compared to the others, which, although adequate yet fail of a high and enduring standard." "In the non-scriptural quotations I have uniformly preferred the... simpler rendering. But the simpler rendering of the scriptural passages so takes away from the essential beauty of scripture that I prefer the more involved but more beautiful rendering." "Number 2 is clearer in expressing the thought—it lacks the authoritative 'tang' of scripture, however, and that is against it." "The majesty of the Word of God is best preserved by the first reading. The second reading lacks beauty and rhythm." "Biblical style seems to carry more authority than the modern style." "More beautiful and more powerful." "While the second passage possesses the benefits of simplicity, I feel, the first is worded more powerfully and appeals more to one's emotions."

A considerable number of subjects in all the groups gave familiarity with the passages as the reason for choosing the original versions of the Biblical material.

"In most cases the second of the two was chosen because the language yields a greater clarity—the language is more familiar. However, in the one case where I chose the first passage, it was one that was familiar to me, and I probably chose it for 'sentimental' reasons. Perhaps this would have changed my choice in all cases, were I more familiar with the other passages." "I like the first one because I'm more familiar with it." "This I chose because it has always been one of my favourite passages. I think the second version destroys the beauty of the language. Perhaps if I were not so familiar with it I would have chosen the second, but the music of the words in the first is what I like." "Prefer top paragraph because of its 'feeling of similarity', 'familiarity'. The way it was learned." "Perhaps previous familiarity with the quotations—as such—not with the style however." "I like the first better because it's familiar, but I realise that this is rather foolish and that if both were completely new to me I should choose the second."

In view of this stress on familiarity, figures for the choices of familiar and unfamiliar Biblical passages were worked out and are given in Table 2. It will be seen that the association between familiarity and choice of the original version is positive, and is just statistically significant in the present data. Non-Biblical passages were regarded as familiar in only eleven cases, and have, therefore, not been tabulated.

While in most cases the reasons for choices referred to general features of the passages, a considerable number of cases occurred in all three groups of a single detail apparently determining the whole judgement. It is noteworthy that the detail concerned was more frequently the object of dislike than of approval.

"I prefer 'Thou shalt' to 'You must' in such a familiar, almost liturgical passage." "I guess my negative reaction here is to the use of 'Ye'." "I object to the *or* in the first line of the first passage." "The word 'flippantly' is entirely disagreeable to me."

The role of these details in determining choice seems to have been similar to that of the 'dominant details' described by Bartlett as organizers of perception and remembering⁽¹⁾

It is a somewhat hazardous undertaking to draw general conclusions from such data as the reasons for choice summarized above, but it seems safe and worth while to point out that each pair of passages appeared to present the subjects with a problem in the solving of which they used, as far as possible, a repertoire of preformed response tendencies. Thus, when a passage was familiar, it tended to be chosen for this reason. When it was not, there tended to be an attempt to give it a 'label' by fitting certain features of it into a class to which a pattern of reaction had already been established, and so to give a judgement couched in such terms as 'fittingness' or 'power' or the like or dislike of some detail. Even when the only reasons given were simple statements of preference for clarity or literary quality, it seemed that the same kind of process was at work, although the features of the passages concerned and the reactions to them were in these cases less well defined.

Table 2. *The association between familiarity and preference for the originals of Biblical passages*

	Original preferred	Modern version preferred	τ	P
Familiar	51	26}	0.170	0.048
Unfamiliar	21	22}		

Some of these preformed response tendencies, especially those implied by familiarity and the like or dislike of details, seem to be specific to certain passages or words or phrases. It is important to recognize, however, that they cannot be the products solely of a general tendency for a response, once made to a stimulus or type of stimulus, to be repeated when the stimulus concerned is met with again. If they were, we should expect that any difference between churchgoers and non-churchgoers should appear in their reactions to the Biblical classes of passage with which they had different degrees of acquaintance, and that in their reactions to non-Biblical passages both groups should be about equal. The quantitative results show that this is not the case: the separation between the churchgoers and non-churchgoers is not in the Biblical but in the non-Biblical classes of passage, indicating that acquaintance on the part of churchgoers with Biblical material influenced their response, not so much to this, as to non-Biblical material. It seems clear, therefore, that the preformed tendencies which the subjects brought to bear upon the passages did not refer only to single stimuli or types of stimulus in isolation, but were the products of a kind of 'background' built up in relation to a range of material, and that responses to the whole of this range must be considered if the effects of increased acquaintance with Biblical material are to be adequately assessed.

V. IMPLICATIONS FOR RESEARCH

In concluding, it seems worth while to consider the implications of these results for research. Had the investigation been confined to the Biblical passages, as it might easily have been in a study of habit-formation in churchgoers as contrasted with non-churchgoers, we should almost certainly have concluded that there were no differences between the two groups in their liking for Biblical language. It is true that we should have found some qualitative differences in the reasons for their liking or disliking it, but unless our discrimination in classifying these reasons had been exceptionally keen, we might still have regarded the differences between the groups as unimportant. It seems more than probable that similar relationships between what may be regarded as experimental and control

groups (in the present instance churchgoers and non-churchgoers respectively) exist with regard to other 'habit-formations' of interest to the experimental psychologist dealing with social material. If this is so it would help to explain why the expected differences between such groups has frequently not been found, or has been found to be small, and would suggest a method whereby the presence of habit formation could be detected by looking, not for increased tendency to give a particular response in the field directly concerned, but for decreased tendency to give this response, or increased tendency to give opposed responses, in other fields. It also indicates that when a difference of response between such groups is observed, its cause may have to be sought at some distance from the point at which it appears.

VI. SUMMARY

The experiment described in this paper was designed to study the liking for the type of language found in the Authorized Version of the Bible when used for various classes of prose passage, some religious, some secular, and to compare preferences for this type as opposed to more modern language among groups of subjects having different degrees of church attachment.

The subjects' preferences indicated that the liking for Biblical language falls off when it is used to express non-religious subject matter, and that while the tendency to choose the original language for Biblical passages is about equal among churchgoers and non-churchgoers, the tendency to choose this type of language for non-Biblical material is *greater* among the latter than among the former. The 'stimulus-response' relationships involved in this somewhat surprising result are discussed in relation to the common assumption that habit formation consists in stereotyping of the response to a stimulus; and it is concluded that they furnish an example not of this, but of the complementary phenomenon of 'Canalization', in which the stimuli that can elicit a particular response become restricted.

Reasons given by the subjects for preferences appeared to indicate that in passing judgements of like and dislike upon the passages, they were using as far as they could a repertoire of preformed patterns of response emanating from a more or less 'structured' background.

The implications of these results for methods of research into habit-formation in the social field are discussed.

My thanks are due to the University of Princeton for a Visiting Fellowship, during the tenure of which most of the work here reported was carried out, to colleagues and friends at Princeton for their assistance in preparing and checking the material, to Mr J. W. Whitfield for assistance with the statistical method used, and to other colleagues at Cambridge for many helpful suggestions regarding the preparation of the manuscript.

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ADJUSTMENTS TO BLINDNESS*

BY J. F. WILSON

The strange life of the blind has, for centuries, excited the curiosity of scholars and the wonder of ordinary men. In early times, when the inexplicable was twin to the miraculous, the blind were frequently credited with supernatural powers, as though the capricious gods might endow with sublime eloquence and divine clairvoyance those whom they had deprived of mortal sight. Such traditions are familiar in fables of Egypt, Persia, India and China, and throughout Greek literature in such figures as Tiresias, blind accuser of *Œdipus* and prophet of Hades, and Demodocus, the wonderful singer of songs in the eighth book of the *Odyssey*.

These beliefs die hard. Even in present-day England most people interpret the techniques of the blind in terms of some miraculous sixth sense. Not long ago, a widely read novel described a blind detective who could read minute handwriting by impressions left by the pen on the paper, could distinguish in a crowd the footsteps of a man whom he had met only once before, and could identify colours by touch. In fairness to the author I must confess that he added verisimilitude to his narrative by limiting this last miracle to the pure colours of the spectrum. However, I question whether a credulous public would so readily have accepted a paralytic who flew on a broomstick, or a deaf man who could hear the music of the spheres.

It is a strange perversity that people who credit the blind in general with these miraculous powers often treat the blind individually as the most pathetically helpless of mortals. Both attitudes are as understandable as they are unreasonable, for whereas the handicap of blindness is obvious, the techniques by which the blind overcome it are a mystery to all but the initiated.

In economic life this tradition of helpless dependency has most unfortunate results. Employers find every excuse for not engaging the blind even though we can prove that their labour is efficient. Blind professional beggars have undoubtedly done much to foster this tradition, just as modern appeals' organizations at their worst exploit it to-day. That charities for the blind developed earlier, and are more generously supported, than charities caring for other disabled, is partly due to the distinction drawn in the public's mind between blindness and all other disabilities.

For these reasons, a blind person is a curiosity to all but his intimates, and wherever he goes he is on show. Travelling alone, he must develop a macabre humour to survive situations in which he is treated as a hero, an invalid or a beggar. His idiosyncrasies are taken as the characteristics of his community, and his individuality is frequently overlooked in so far as it departs from the tradition of what a blind person should be. If a blind masseur fractures his patient's thigh, or a blind engineer ruins a component, the accident is put down to blindness, not to individual incompetence, and other blind people suffer for it. Occasionally, this common cloak of blindness seems to hide even physical differences, for often someone who helps me across a road will continue a conversation which he started

* A paper read at a meeting of the British Psychological Society held at University College, London, on 9 February 1946. The author of this paper has been blind since boyhood. The article appears precisely as it was originally presented.

when he did the same act of kindness for a different blind man yesterday. In these respects, our position in society is much like that of a foreigner whose individuality is disregarded amongst characteristics attributed to his countrymen generally. The volatile Frenchman, the operatic Italian, the heroic or pathetic blind man.

I have laid emphasis on these popular traditions because all blind people must, to some extent, react to them, and because they complicate, and render more intellectually exacting, the whole process of our adjustment to society. One of the main handicaps of blindness is the public's attitude towards it, and one of the main problems for every blind individual is to achieve a right assessment of his abilities. It is fatally easy to conform to the traditional pattern, to become a hero or a dependent, and that way lies moral and often physical disaster. Some blind people insulate themselves from the problem behind the walls of sheltered employment, becoming leaders of a subsidized minority clamouring for unjustifiable benefits which society cannot refuse. Others retreat into an aloof intellectualism, or take refuge from society behind a hedgehog defence of ill manners.

The only solution is to accept the prejudices of society charitably, analysing one's own abilities in relation to them. Whilst remaining within the unity of that society one must find, and where possible express, one's own standards as a developing individual. That demands considerable integrity and an intellectual discipline beyond the average. Moreover, it involves a mental and physical strain which is too often disregarded. For that reason, let us not over-simplify the problem or blame those who, often through no fault of their own, have failed to solve it. We are only now beginning to devise methods of education and rehabilitation which will equip the disabled to take their place as contributing, full-sized, members of society.

At this point, scientists can do much to help us. They may be assured of ready co-operation both from Blind Welfare and from the blind themselves. Incidentally, such specialized research might add significantly to our knowledge of normal psychology, and of social prejudices generally. Much fertile ground has already been covered by professional and amateur psychologists from Diderot to the present day, but their findings have been inconclusive for the most part and frequently conflicting. We certainly have not yet found a firm scientific base for the study of the problems of blindness.

For example, Hayes' theory of the vicariate of the senses fell before the withering statistics of Greisbach and Kunz, who, after measuring the sensory acuity of a respectable number of blind children in France and Germany, concluded that the loss of a major sense impairs rather than increases the acuity of the others. Similar conflict on fundamentals is evident in the work of more recent writers. Cutsforth, in a brilliant thesis entitled "The Blind in School and Society" affirms that "under the conditions imposed on them by Society" not one of the sixty thousand blind people in the United States "has developed, or can possibly develop, a strictly normal personality". Other writers, of whom the most recent is Dr Ritchie, in his book, *Concerning the Blind*, reject the theory that there is a distinct psychology of blindness.

An obstacle to all such study is that, from the statistical standpoint, the blind are a small and unhomogeneous community, and that blindness is frequently associated with general debility, old age, or secondary disabilities. Moreover, blindness itself often condemns an individual to a life of segregation which may virtually sterilize normal growth of mind or body. Based on such imperfect and artificial statistics, psychological generalizations may well be as dangerous as popular prejudices.

At the outset, I think we must recognize that blindness is controlled by temperament and intelligence as much as those qualities are themselves controlled by blindness. The blind are a diverse community, amongst whom a normal range of temperament and intelligence exists, and whose only common sensory limitation is blindness. That limitation creates common problems, and may lead to common trends of behaviour. Moreover, within the blind community is a number of categories, each with its special problems and tendencies, but no single categorization will serve all purposes.

From the point of view of adjustment to blindness (and from that point of view alone) I would distinguish three categories of blind people. First, those who are born blind or become so before the end of adolescence. Secondly, those who go blind between that age and the end of middle life. With decreasing ability towards the end of the age group they can, subject to individual limitations, attain a fair adjustment to blindness. Thirdly, those who go blind in late life who, for practical purposes, are sighted people without sight.

I shall call the first two categories respectively 'the Blind' and 'the Blinded'. The third category, whom I shall call 'the Sightless', are by far the largest section in the blind community but, with them, blindness is but an incident of old age, and should, in my view, be treated as such.

Amongst the blinded I draw no distinction, as many writers do, between those who go blind suddenly, and those who lose sight gradually. That fact alone does not seem to control the standard of ultimate adjustment attained, though I am, of course, dealing with people who have no useful sight and not with partially sighted people registered as blind for administrative purposes.

The handicaps of blindness (I use the plural deliberately) are less direct, and the processes of adjustment to them more subtle, than is commonly realized. Certainly the picture conjured by Milton, in *Samson Agonistes*, of a blind man tortured ever by the obscurity of his darkened world—"O dark, dark, dark amid the blaze of noon"—is as untrue as it is dramatic. To the always-blind light is simply a word without reality and the blinded are not, in my experience, acutely conscious of its absence even in the early days of blindness. That fact seems difficult for sighted people to appreciate, which may be the reason why many Braille magazines bear titles such as *The Lightbringer*, *The Rainbow*, *The Lantern*, or *The Beacon*. At school we made heartless fun of a certain French Grammar on the frontispiece of which was brailled, somewhat inappropriately for our benefit: "They that sat in the darkness saw a great light".

Nor do I believe that many blind people are in constant rebellion against the handicap of blindness or constantly wish for sight. That may be true of blinded artists, and others for whom colour and visual form had a special significance, but their situation is complicated by considerations of vocation and livelihood. Latent in the mind of some blind people, as Cutsforth suggests, may be a vicious resentment against society, expressing itself in sadistic fantasies, churlish ill-manners or an attitude of destructive criticism and insubordination to authority. The following passage, written by a blinded woman, corresponds closely to evidence assembled by Cutsforth on this question. She writes:

"For many years I have had a strange and rather frightening daydream. It usually comes when I am put in an embarrassing position by my blindness as, for example, when I bump into a man in a crowded train. I picture myself parading a number of people against a high wall where I shoot them all with a machine-gun. Through the years I have added many details to the dream and the people have changed. They used to be some of

the teachers at school but now they are usually certain friends at work and a number of imaginary people who are always in the picture."

Such evidence certainly does not mean that the blind, or even the blinded, constantly covet the gift of sight. This point was driven home forcibly to me some years ago when I was the subject of some tests based on Jules Romaines's theory that organs, which he calls 'Oculi' in the skin, can be developed as a substitute for retinal vision. I resisted, and ultimately abandoned, the experiments, not so much because they appeared tiresome and unproductive as because concentration on the prospect of regaining my sight caused me a good deal of mental disturbance. There is, perhaps, an inertia of mind which resists the changes and complexities of life which would result from the alleviation of a disability even though the advantages of the cure are appreciated academically. An ophthalmologist tells me that he has observed the same perverse reaction in blind patients who are about to undergo corneal graft operations. A colleague of mine, who has been blind from birth, refused, at the age of sixteen, to co-operate in treatment which might have brought him some sight, simply because he could not face the consequences of its success. If you will permit another somewhat grim schoolboy reminiscence, I remember a boy at Worcester who showed signs of hysteria whenever he was teased with the prospect that he might one day become sighted. I do not wish to generalize from these individual cases, for undoubtedly much contrary evidence could be adduced, but perhaps they may have some significance in relation to narcissism and the psychological aspect of disease and accident-proneness.

But I must return to my point that the main handicaps of blindness are secondary to the simple absence of sight. Amongst them, the limitation on physical freedom, and its mental consequences, is perhaps the most far reaching. Many blind men, and most blind women, never venture beyond the safety of their home or place of work. All our movements are controlled by predetermined techniques, and even the most efficient of us attains only within the narrow limits of organized sport or planned exercises to the exhilaration of careless, relaxed vigour. Even on known ground we must proceed warily, calculating every angle, attentive to catch the shade of meaning in an echo. I often return from a country walk alone, with a positive headache from the effort of concentration it demands.

This world of ours is so foreign to sighted people that a description of my own daily walk to the station may be worth quoting, as it reveals some of our techniques and may illustrate a number of my later observations. Here it is:

The concrete wall looming immensely on my right ends abruptly. For twenty yards I must walk by dead reckoning, with no guiding echo. Carefully I judge the line which will bisect the angle between the lamp post and the high pavement, and walk along it with wary control. A detour over waste land would avoid both obstacles, but a blind man has the pride of his craft. There is an odd triumph in such things.

Now I hold my breath, that I may hear sooner the insubstantial echo of the wooden railings. As I touch them, a shudder runs ahead, marking their pliant length, and jerks suddenly to a tension at the concrete post.

Now the way to the station is easy, well plotted by familiar features. The beech tree, a grim, silent presence now, but whose leaves in windy autumn are a dancer in taffeta. The corner, where my footsteps throw a whining echo from the crevassed buildings. An echo which deepens as the road narrows between overhanging walls until, amplified a thousandfold, my footsteps march like an army towards me.

Now, at the edge of these frail echoes, another sound is imposing its dominance. It reaches its stunning crescendo, torturing the air, as the fighter plane swoops on its giant way. Earthbound and mutely I walk, withdrawn into my own perimeter, save where my two feet, and the point of my stick, touch the ground.

Then, through the swift diminuendo, my quiet echoes reassert themselves, padding on velvet tiptoe behind me, for the surface of the road has softened.

As I turn into the cavernous entrance of the station, a Mecca of antiseptic smells, I am jostled into a queue. A soldier's coarse haversack, the sleek texture of a fur coat. Thirteen steps, then nine, and the intense coldness of the metal banister. The concrete wall is drab and rough after the polished veneer of the metal. I relax against its safety thankfully.

The journey there described is less than three hundred yards, but I do not think that I have exaggerated its complexity. The point I wish to make is that these limitations on physical freedom not only tend to crude muscular co-ordinations, and occasionally to malformations or positive invalidism, but that they may distort an otherwise normal personality. They also create a need for self stimulation, often expressed in the tappings, rockings and rhythmic tics of one sort and another, which we call 'blindisms'. That these idiosyncrasies are frequently erotic, or at least evocative, and are often accompanied by fantasy, is due, perhaps, to the self centredness which, resulting from limitations on normal physical expression, makes the body the instrument of experience as well as its medium.

These limitations, in their total effect, occasionally (but I would not say commonly) produce, amongst the blind, that consciousness of being an imperfect, crippled animal which is said sometimes to be felt acutely by dwarfs and mutilated people. In wartime this is accentuated by exclusion from military service, segregating the young disabled from the experiences of their generation.

On women the effect is more subtle, for their whole position in society makes blindness a frustrating handicap in all achievements and particularly those which do not depend upon career. The dangerous compensations of the heroic tradition (to which I referred earlier) are not so readily available to them. Travelling alone they do not receive, and without constant embarrassment cannot ask for, the great measure of help which sighted passers-by gladly accord to blind men. They must develop an attitude of rugged insensitiveness which is itself harmful to their personality. It is not surprising that many of them give up the struggle, becoming embittered and easy prey to cranks and fads of one sort or another.

However, I do not wish to exaggerate these physical limitations in relation to the total problem of adjustment. Some of the most successful and mentally balanced blind people I know are physically inept. The ultimate problem for each blind individual is to find the terms on which he can integrate himself with a society which is not equipped for him, and which has no standard by which to judge values which can be meaningful to him alone. Whilst remaining within the unity of that society, rather than becoming simply a devotee of his own specialized minority, he must find, and if possible express, his own conceptions of objective reality.

In assessing the extent to which this is possible, or even desirable, we reach a question which has never been satisfactorily answered by educationists, and which is now being studied afresh in connexion with courses of rehabilitation. Should we so foster the blind child's individuality that, in our search for experiences and modes of expression which are meaningful to him, we risk creating an unacceptable social type? Should we encourage the newly blinded to remodel their whole life so that they may live intensely as developing individuals, or should we rather encourage them to cherish their memory of sighted days and continue, so far as possible, to live as though nothing had happened? Should we say, as did Sir Arthur Pearson, that "The Blind can do anything except see"?

Fortunately, the alternatives posed in these questions are not, as some would have us believe, categorical opposites. A compromise is possible, and is achieved by every blind

person who tries honestly to live out the problem. The question is, where should the compromise be drawn, for there is clearly a point at which preoccupation with the techniques of blindness renders integration with society increasingly difficult.

I cannot answer that question, but I can furnish some data on which part of an answer may be given. It involves comparison between the concepts of blind and sighted people, and the extent to which our conceptual limitations prevent our appreciating or contributing to, universal modes of expression. Here I must discard my threefold categorization in favour of a distinction drawn by Pierre Villey between the always-blind, and those who go blind after a significant experience of sight.

To get an idea of the formal, tactual concept of a person blind from birth, all considerations of colour and perspective, and all two-dimensional concepts, must be abandoned. The result is a three-dimensional concept elaborated by considerations of texture and the ideas associated with it. Such a concept will usually be precise, admitting no ambiguity or hallucination. A blind friend of Diderot's said vividly "If I had arms that would reach to the moon my fingers would soon get a more exact idea of it than you could ever do with your telescopes".

The primary object of a tactual conception must necessarily be small enough to be felt. Blind people differ in their ability to correlate single tactual concepts imaginatively into something like a tactual 'scene'. Undoubtedly, some are able to build up a tri-dimensional picture of a very large object from its single, feelable components. The following lines from a poem entitled *Touch Landscape* by the late W. H. Coates, himself blind from birth, is a remarkable example of that ability exceptionally developed:

Then stepped my fancy out over the scene.
Through stiff bracken she waded,
The turf caressed her feet,
The ground flowed away in broad slopes towards the valley.
She heard the shadow-sound of trees;
Her hands brushed the fields—a thousand acres—
To touch the distant wood.
Flung like a scarf of lace
Upon the knees of the hills.
She buried her face in grasses rich and cool
When to the plain she leapt
Beside a level river—
A polished strip of metal cutting the pastures.
And thence to farther hills
Swelling beneath my disembodied hands
In three-dimensional curves:
Most lovely hills, phantom and far away
And overlaid with velvet.
And farther yet, beyond the misty hills,
I reached the wrinkled sea;
I touched the waves with crests of thistledown.

This correlating process clearly involves a considerable effort of imagination, and I question whether many blind people attain to it. From evidence which I have accumulated, and from my own experience, it appears that large objects are more often conceived by a process of imagination which reduces them to touchable size, or by the blind subject projecting himself as it were into the situation conceived. These two methods are

exemplified in the following answers, from two men blind from birth, to a question which I put to them:

Example 1. The Reduction Process

You ask how I can picture a battleship shooting at an attacking aeroplane. At first my mind will register only a confusion of noises such as the B.B.C. Effects Department would produce for such an occasion. But, when I get past that, I find that what I am actually doing is something like producing a puppet show. The battleship, a spiky toy affair, such as I played with in my bath as a child, and the aeroplane diving to the attack in proportion. I am following its descent with my cupped hands as I might the flight of a wasp.

Example 2. The Projection Process

I don't conceive the whole thing, such as a battleship, ever. It's more the case of me on the bridge, me in a turret, me walking along a corridor below the waterline. Picturing a train, I may occasionally think of it as a trembling arrow of sound that hurls itself through the station, setting everything a-quiver and gone in a flash. More often it would be me in a compartment with no sense of the whole train beyond the rhythm and movement of the carriage.

Compared with the possible grandeur and richness of visual imagery, both these types of concept are faint and sterile. The first permits but a weak grasp of objective reality, whilst the second can hardly be called objective at all. The question arises to what extent the imagery of people who have some significant memory of sight is richer and more satisfying.

My experience (though I quote it diffidently, not having had an opportunity to make a thorough study of a large number of cases) is that the more a blinded person achieves an adjustment to blindness, the closer will his imagery approximate to that of the always-blind. Memories of colour and perspective soon become uncertain, requiring an increasing effort of will to recapture. Words and phrases based on visual concepts lose their power to evoke a clear response in visual memory. My own experience is, I think, typical of many who, like myself, retain visual memories from childhood, but have lived half a life without sight. With few exceptions, mainly in respect of things I knew intimately as a child, my conception of objects of feelable size is tactual and three-dimensional. To imagine a scene two-dimensionally I have to exert as great an effort as would be required for a sighted person to imagine it three-dimensionally. My advantage over the always-blind in this matter is that I can make the effort, but, in fact, I seldom do.

Even that ability of mine is limited to scenes whose components were known to me in childhood. Contemplating a tour of tropical Africa which I plan to undertake this summer, I am completely unable to achieve any conception of the territory apart from specific situations such as myself in a mosquito net, myself listening to the buzz and chatter of an African market. A sighted person with a similar background to my own would probably have a workable conception of tropical Africa built up from films, pictures and from visits to the Zoo and tropical gardens.

Even when imagining scenery whose components I knew in childhood, I cannot add colour with certainty. The experience is an odd one, as though I were looking at a moving stereoscopic film in monochrome. Moreover, colour seldom appears in my dreams, which are a strange jumble of visual and tactual concepts. Sometimes, in my dreams, it is as though I were sensing the same object at two levels, one tactual and three-dimensional, the other visual and two-dimensional.

In the ordinary business of everyday life, such limitations have little practical importance. In cultural and aesthetic life they form a constant barrier to intercourse with the minds of

one's fellow men, and to appreciation of universal forms of expression. The whole emphasis of our experience and interest is shifted from things to people, from objective to subjective realities.

This problem is most marked in our appreciation of literature. Almost every page of every book is studded with words and metaphors which can evoke no response in the experience of the always-blind, and which recall but a fading, phantom image to the blinded. Even if it were desirable, or theoretically possible, for us to avoid verbalism, we could not, in practice do so and remain in communication with our fellow men. For that reason, I believe that much of the controversy about Helen Keller's verbalism is unjust and impracticable. Miss Keller never attempted to write great literature, and the extent to which she has grasped some meaning from the language of a seeing and hearing world is a brilliant example of imagination and intelligence.

The following passage written by an always-blind student of French literature may reveal the problem in its acutest form:

Throughout my University course [he writes], I was constantly up against the problem that I had no yardstick by which to measure the finer points of literary style. I had a linguistic ability above the average and could, of course, appreciate the intellectual quality, and power of characterization, of the authors concerned. Beyond that is the subtle play of metaphor, and the evocative power of visual imagery and in that sphere I had no safe standard, simply because the metaphors and images could arouse no response in my own experience. This was a specialized handicap in my case, but it symbolizes the whole frustrating limitation of blindness in cultural life, and our ultimate inability to appreciate, and contribute to, a universal culture.

To a lesser extent, this limitation is true also of our own efforts at literary expression. So limited is the vocabulary of tactual and auditory sensation that we cannot avoid visual metaphors even to describe experiences which are within our sensory range: "The wink of a glancing echo", "a trembling arrow of sound, gone in a flash".

The limit of such transposition is soon reached. Such a style could never form the basis of great writing or, at least, of great verse. An argument against the tradition that Homer was born blind is that no sensitive artist, who had no visual memories would so constantly have used the phrase 'wine-dark sea' when he had the Greek equivalent for 'the wrinkled sea'. Milton, of course, is in a different category, for he lost his sight only in his fifty-fourth year after a life of rich visual experience.

Some blind writers have endeavoured to limit their expression strictly to concepts which are directly meaningful to them. The poem already quoted from W. H. Coates' book *Beating Shoes* is an outstanding example of that technique successfully applied. He would, I am sure, have agreed that his work could only at best, be a specialized literary curiosity to the sighted world, though intensely meaningful to the blind. The technique must always be self-conscious, imposing narrow limits to the choice of subject-matter. Though not apparent at first glance (I question whether many members of this audience have noticed that I deliberately avoided purely visual words and metaphors in this paper) its thinness is soon revealed by close analysis.

The problem is somewhat like that of translating from one language into another, and a number of blind writers have approached it from that standpoint. The following translation, into tactual symbolism, of a visual passage from the second act of Shelley's *Prometheus Unbound* is the most successful application of this technique I know. It again is the work of W. H. Coates, but has never been published.

First the passage as Shelley wrote it (*Prometheus Unbound*, Act II, line 19):

The point of one white star is quivering still
 Deep in the orange light of widening morn
 Beyond the purple mountains: through a chasm
 Of wind divided mist the darker lake
 Reflects it; now it wanes: it gleams again
 As the waves fade, and as the burning threads
 Of woven cloud unravel in pale air:
 'Tis lost! And through yon peaks of cloudlike snow
 The roseate sunlight quivers:....

Now the same passage translated into tactual imagery:

One cold metallic grain is quivering still
 Deep in the flood of warm etherial fluid
 Beyond the velvet mountains: through a chasm
 In banks of fleece the heavier lake is splashed
 With flakes of fiery foam; it wanes: it grows
 As the waves thicken, and as the burning threads
 Of woven wool unravel in tepid air;
 'Tis lost! And through the unsubstantial snow
 Of yonder peaks quivers the living form
 And vigour of the sun:....

In the harmony of that passage I must find the note of my conclusion. In the brief span of so short a paper I have left much unsaid. At least I may have been able to parade before you some original evidence whose significance you will be better able to judge than I. At each point of the argument, modifying data could have been adduced and I hope that some day the subject will be explored with the thoroughness it deserves.

HUMPHREY'S PARADOX: A FURTHER INVESTIGATION

By D. C. FRASER

I. *Introduction* (pp. 227-228). II. *A new experiment to meet Hull's criticisms* (p. 228). III. *Experimental details* (pp. 228-229). IV. *Apparatus* (p. 229). V. *Procedure* (pp. 229-231). VI. *Discussion of experimental findings* (pp. 231-232). VII. *Summary* (pp. 232-233). *Appendix* (p. 233). *References* (p. 233).

I. INTRODUCTION

The Gestalt psychologists base their treatment of learning on the primacy of the configuration. They appear to hold that an adequate derivation of the reaction of organisms to stimulus configurations is impossible from behaviouristic principles. Hull⁽¹⁾ has attempted to deal with some of the phenomena of behaviour in a relatively sophisticated manner, and, utilizing a skilfully developed theory of interaction of afferent neural impulses, has contrived to indicate a possible description of many phenomena along behaviourist lines.

At this stage his conclusions and hypotheses are tentative, and on the whole he confines himself to formulating postulates from the observable data. An interesting example of his attempt to apply these primary principles to specific problems is shown in his revaluation along the line of neural interaction theory of the results of the experiment which is described as Humphrey's Paradox. This experiment was performed by Humphrey in 1927 and quoted by him ⁽²⁾, p. 237; note in brackets p. 198) in 1933 as follows:

Subjects were trained...to raise their hand at the sound of a certain specific tone. The training was accomplished by administering an electric shock when the tone was sounded, but never when any other tone was sounded. Suppose that the active tone was G above middle C. We have then a conditioned reflex to this tone which has been differentiated out so that no other tone producible on the apparatus was followed by response. By prolonged practice this conditioned reflex became very highly stabilised. Suppose now that the active note is included in a melody or an arpeggio such as that formed by the successive notes C, E, G, C, where G is the active note. (The instrument was of the xylophone type with metal cylinders which were not damped after a note was struck, consequently the vibrations from one note persisted during the striking of the next note, as in legato piano playing.) The arpeggio then contains the stimulus for the conditioned response. The records show that while the isolated note was consistently followed by response, the same note, repeated immediately in an arpeggio, was consistently not followed by response. The melody "Home Sweet Home" when played in the key of C contains the note G fourteen times. Experiments showed that subjects trained to this note consistently respond to it when presented in isolation, and do not respond to it when presented in the melody. This result is very striking in view of the fact of the fourteen repetitions of the active note included in the melody as played.

Hull proceeds to interpret the results of this experiment as follows ⁽¹⁾, pp. 372-4):

The above account seems to show that when the note G was struck, the preceding notes C and E were also still vibrating, which would produce a simultaneous stimulus compound. In the case of the melody "Home Sweet Home" presumably sometimes there would be a simultaneous stimulus compound of the 'active' note and the two or three preceding notes combined with a temporal compound made up of the impulses from these active stimuli and the perseverative stimulus traces arising from the stimulations of the more remotely preceding notes. Since according to the preceding analysis, afferent impulses and perseverative traces operate in much the same way, an analysis of the simpler arpeggio situation will suffice for both.

The analysis consists of showing that the afferent impulse from the stimulus note C is changed when conjoined with the afferent impulses arising from the stimulus notes C and E. This alone, he maintains, might easily weaken the reaction potential sufficiently

to produce external inhibition. In addition, by differential reinforcement, a considerable amount of conditioned inhibition has been developed to the stimulus notes C and E. As a result of afferent interaction both the excitatory and the inhibitory tendencies will suffer a reduction in strength when they enter the compound. Hull seeks to show that the net effective reaction potential available for reaction evocation in the arpeggio would therefore be below the reaction threshold, and the hand would not be lifted during the playing of the arpeggio.

II. A NEW EXPERIMENT TO MEET HULL'S CRITICISMS

Prof. Drever accordingly suggested a new experiment which would not be open to these criticisms. The main points of this are:

(1) Stern's variator should be used to produce the stimuli. Two variators were used, the frequencies of which ranged from an upper limit of 580 cyc./sec. to a lower limit of 200 cyc./sec. As a tone is sounded by the emission of air through the mouth of a 'bottle', one stimulus is entirely completed before another begins. This eliminates the persistence of vibration from one note to the next.

(2) The Gestalt should be reduced to a very simple one, viz. 'Cuckoo'. It was found possible to produce a realistic facsimile of this meaningful configuration by the use of a frequency of 430 cyc./sec. for the first syllable, and 350 cyc./sec. for the second syllable. This reduces the stimulus compound to the simplest possible.

(3) The notes to which the subject was negatively conditioned were chosen to be well above and below the active note, and did not include the first syllable of the Gestalt (the second syllable being the active note), so that no negative conditioning should be carried over from the first syllable of the Gestalt to the second.

III. EXPERIMENTAL DETAILS

Although the experiment reads quite simply in Humphrey's book, reference to the paper (3) shows that the experimental arrangement is not as straightforward as the bald account quoted seems to indicate. In particular, Humphrey found that it was not possible to condition all his subjects. Out of nine subjects: one responded to the 'right' note but was unable to learn not to respond to the 'wrong' ones; three did not develop conditioned responses at all, one after 800 combined stimulations, another after 1000; two were entirely discomfited after the first half-hour; and only three subjects survived and developed well discriminated responses.

This, as will be seen, is quite to be expected. The human subject does not appear to react to conditioning in the simple, 'mathematical' way of which Watson would approve. This type of shock-conditioning experiment cannot be freed entirely from complicating external stimuli. And, as Humphrey points out, the whole set-up is highly unnatural. The subject is kept at the table in an obnoxious situation. Humphrey was obliged to pay some of his subjects highly to induce them to endure the ordeal; in the present experiment, although such a drastic resource was not found necessary, it was obvious that the subject was often highly discomfited. In such circumstances, the failure to establish conditioning is understandable. In one case, 5000 combined stimulations over a period of days failed to produce a stabilized discrimination.

It was particularly noticeable that the 'set' of the subject was a vital factor. If the subject apparently decided that his or her endurance was being tested, it was impossible to establish conditioning to an extent necessary to satisfy the criterion of resistance to

experimental extinction. Humphrey also notes the critical importance of this. In fact, he was compelled to give his subjects the following instructions (3):

This is an experiment in learning. It is not a test of endurance or nerve or of ability to be fooled. You are asked to behave in an entirely natural way, acting as you might imagine an animal would do in the same situation. Please do not make up your mind that you will or will not behave in a certain way. We are trying to find out what normal human beings do, not how much they can stand or whether we can fool them.

Humphrey comments further that such instruction may give rise to the criticism that the experiment no longer embodies a genuine conditioned reflex, but does not seem to have considered the matter further. It was found necessary in the present experiment to tell the subject that this was not a test of endurance, but it was considered advisable not to include Humphrey's injunction to "act as you might imagine an animal would do".

IV. APPARATUS

This was much simpler than in Humphrey's experiment. A medical coil was used to produce the shock. This was operated by a 4 V. battery and a simple telegraph-type key in the primary circuit. One electrode of the secondary circuit was a thin metal cylinder, held in the subject's right hand. The other electrode was a cup-shaped finger rest, attached to a lever; the other end of the lever had a thin taper attached, which was used to trace the record on a smoked drum. The lever was spring-loaded so that it rose at the electrode end as soon as there was any movement to withdraw the finger; corresponding to this, the taper fell, and duly recorded on the revolving drum. This was found in practice to give a fairly delicate record of any attempt to withdraw the hand.

Early in the experiment, it was decided that the subject might tend to become conditioned to the noise of the buzzer armature of the medical coil. To avoid this, the coil was taken outside the soundproof room in which the experiment was conducted, and operated by remote control.

The shock was timed to occur a fraction of a second after the stimulus note was sounded. This could not be timed with exact precision, but the fact does not seem to be important.

V. PROCEDURE

This falls roughly into three parts:

(A) After a few preliminary trials, it was decided to arrange the stimuli in a definite order, as follows:

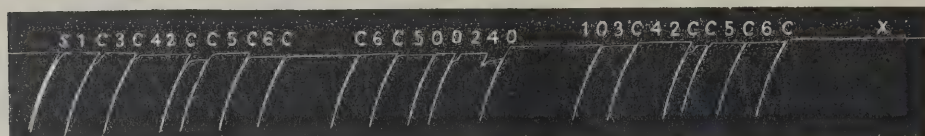
	Frequency		Frequency
Stimulus 1	580	C	350
C (active note)	350	C	350
Stimulus 3	500	Stimulus 5	240
C	350	C	350
Stimulus 4	280	Stimulus 6	200
Stimulus 2	540	C	350

A set of such stimuli constituted a 'session'. The sessions were run through straight or reversed, to introduce some variety, and the order of notes was occasionally varied, for the same reason. In the preliminary sessions, no attempt was made to time the intervals between the stimuli.

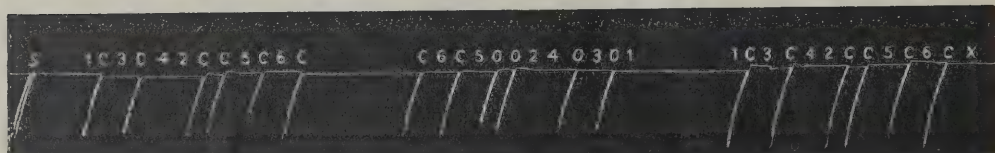
It was decided to run through a number of these sessions until conditioning was established, and then to test the strength of the conditioning by the 'resistance to experimental extinction' criterion. When this criterion was satisfied, it was intended to build up conditioning again by administering further combined stimulations, and then to interpolate the Gestalt.

As will be seen, the latter part of this procedure was not carried out, since it was found impossible to satisfy the criterion.

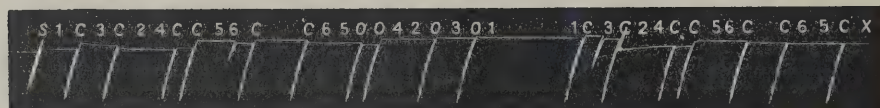
(B) Since it was impossible to establish conditioning adequately by the method given in (A), it was decided to instruct the subject to raise his hand when he heard the active note. This instruction means, of course, that the response involves conscious discrimination, and, although the reaction appeared to become quite automatic after some practice, the technique is more open to criticism than is Humphrey's. However, it was decided to



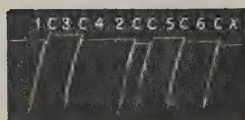
(1)



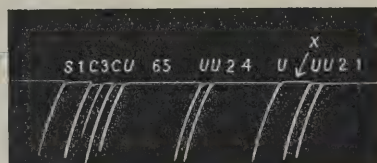
(2)



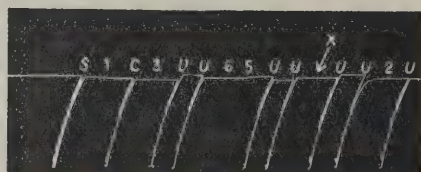
(3)



(4)



(5)



(6)

Fig. 1. S=start of record; C=active note sounded with shock; O=active note sounded without shock; X=sounding of 'Cuckoo'; U=unreinforced active note. For notes on records, see Appendix.

continue with this method until some results were achieved. The actual instruction given to the subject was:

We want you to raise your hand when you hear this particular note (sounding the active note), but not when you hear any other note. To assist in the learning process, you will receive an electric shock when this note is sounded, but not when any other note is sounded.

When the 'conditioning' was adequately established, the smoked drum was brought into play; the subject was instructed to raise and lower his hand twice rapidly to mark the start (S on the record in Fig. 1.). A 'straight' session was given, then a reversed session,

during which, as a rule, resistance to experimental extinction was demonstrated by giving the active note four or five times in the series unaccompanied by the shock, and finally a straight session, during which the active note was reinforced by the shock. Then the Gestalt was sounded, either after a short interval (Record 1), or at the time when a stimulus would normally be expected (Records 2 and 3). During each session, stimuli were given at intervals of 10 sec. to facilitate the marking on the record.

(C) This method, which seems to be the only one by which a true conditioned reflex can be built up in the human subject in the given experimental situation, was employed later. After the subject had been arranged and warned that this was not a test of endurance, conditioning proceeded as before in a number of sessions. This time the first session consisted entirely of stimulations with the active note accompanied by the shock. The next session began also with similar stimulations with the active note and shock, but, during this session, Stimulus 1 was introduced. The subject at first reacted to both stimuli, but the response gradually became differentiated out to the active note. When this differentiation had been well established, Stimulus 6 was introduced, and the process was continued until differentiation of the active note from all the others was clearly established. In the cases in which this could be done, it was found that the resistance to experimental extinction was very marked, since the active note without the shock could be administered a large number of times, and the response was still elicited. Consequently, it was only considered necessary to reinforce the active note with the shock in the series before the Gestalt was interpolated once (Record 4), and in the other two cases after the resistance to experimental extinction had been well tested, the active note was reinforced by the shock for two series, and then the Gestalt was inserted in a series which contained six or seven unreinforced stimulations with the active note.

As before, *S*, *C*, and *X* signify Start, Combined stimulation and Gestalt respectively, but the sounding of the unreinforced active note is represented by *U* on the record (see Fig. 1, Records 4-6). In Record 5, the irregular spacing of the stimulations is due to the fact that they were given at intervals which varied from 5 to 15 sec.

VI. DISCUSSION OF EXPERIMENTAL FINDINGS

The first point that emerges from the experiment is the marked variation in the ability of subjects to acquire 'conditioning' under the conditions of the experiment. It seems apparent that some subjects could never be trained to give a stabilized discrimination at all. This may be due partly to poor pitch discrimination, but is certainly due largely to temperament. Children under the age of 15 were found unsuitable, the shock, apparently, bulking so large in the situation as to exclude the other factors. As will be no surprise to anyone accustomed to clinical work, women subjects, on the whole, tolerated the highly unnatural situation much better than men. During the (A) procedure, the two longest attempts to achieve conditioning, which lasted 16 and 12 hr. respectively, and in the first case involved more than 5000 combined stimulations, were undertaken with women as subjects; and only their cheerful readiness to continue made this feat of endurance possible.

The second point that emerges is the importance of the procedure in determining whether conditioning can be established. Table 1 shows the results obtained with the different procedures.

Owing to the comparatively small number of subjects, it is not possible to say absolutely that the difference in procedure accounts chiefly for the discrepancy between the results

obtained in the (A) and (C) procedures. The three successful subjects in the (C) procedure may have been more suited to the experiment than any of the five unsuccessful subjects in the (A) procedure. However, it was noticeable that the two unsuccessful subjects in the (C) procedure came nearer to acquiring a satisfactorily conditioned response than any of the (A) subjects.

Table 1

Procedure	No. of subjects	Subjects who acquired satisfactory response
(A)	5	0
(B)	10	8
(C)	5	3

The importance of the strength of the shock was also revealed. Although Humphrey does not specifically state the fact, it appears that the strength of the shock in his experiment was the same for each subject. In the present experiment, however, it was found that too powerful a shock tended to produce a catastrophic reaction in the subject, and he tended to pull the hand away at any stimulus. Too mild a shock, on the other hand, does not produce an adequate differentiation.

As for the point at issue, in none of the cases in which 'conditioning' was satisfactorily established was there found any tendency to withdraw the hand when the Gestalt was presented. Three sample records from the (B) procedure subjects are shown in Fig. 1, and the three records of the subjects who achieved a satisfactory degree of conditioning under the (C) procedure. Examination of these shows no apparent motion of the hand when the 'Cuckoo' was sounded. Clearly, the incorporation of the active note into the simplest of meaningful configurations has altered its stimulus value for the subject. In some cases, the Gestalt was repeated more than once with the same subject, but again no tendency to withdraw the hand was recorded.

VII. SUMMARY

1. In 1927, Humphrey⁽¹⁾ performed an experiment on learning, which consisted in training subjects to raise their hand at the sound of a certain specific tone. This conditioned reflex was built up by administering an electric shock when this tone was sounded, but not when any other tone was sounded. When, however, this active note was included in melody or arpeggio played on a xylophone-type instrument, in which the notes were not damped, subjects gave no response. Humphrey⁽²⁾ makes this the basis for a sustained criticism of the conditioned reflex theory of learning.

2. Hull⁽¹⁾ criticizes this experiment on two main grounds: (a) Since the metal cylinders of the instrument were not damped, the vibrations from one note were carried on to the next note, producing a simultaneous stimulus compound. (b) The other notes of the melody or arpeggio were negatively conditioned, and this reactive inhibition was carried over to the active note.

Hull tries to show, that, as a result, the net reaction potential would be below the reaction threshold.

3. A new experiment was carried out in which the first criticism was allowed for by using Stern's variator to produce the stimuli, and the second by choosing a very simple Gestalt, in which neither of the notes was negatively conditioned.

4. It was found very difficult to build up a highly stabilized response in many cases, and three separate types of procedure were used in the experiment.

5. In all cases where a satisfactory response was held to have been acquired, the subjects gave no response when the active note was incorporated in the Gestalt.

My thanks are due to Prof. Drever for advice and discussion, and to Mr John Houston, Miss Mary Rogan and my wife for their help with the experimental work.

APPENDIX: NOTE ON RECORDS

Record 1. Subject was a first-year girl student, age 18. 'Conditioning' was rapidly established under the (B) procedure, but response was not perfectly discriminated, even after prolonged practice. V. the partial withdrawal of the hand on one of the presentations of Stimulus 4.

Record 2. Subject female, age 25. The response was well stabilized, after a fair amount of practice, under the (B) procedure.

Record 3. Subject male, age 17. Even after considerable practice, there was a tendency to withdraw occasionally on the 'wrong' note. Procedure (B).

Record 4. Subject male, age 16. Response highly stabilized under the (C) procedure. Resistance to experimental extinction was very marked.

Record 5. Subject male, age 24. This is of particular interest, as the subject did not develop good discrimination after over 1000 combined stimulations. Altering of the strength of the shock produced a marked difference, and the subject acquired a fairly stable response after another 200 combined stimulations, though there was an occasional tendency to withdraw on the 'wrong' note. Procedure (C).

Record 6. Subject male, age 25. This was a very good subject, who acquired a highly stabilized discrimination, under the (C) procedure, after little more than 300 combined stimulations.

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- (1) HULL, C. L. (1943). *Principles of Behaviour*. New York: D. Appleton-Century Co.
- (2) HUMPHREY, G. (1933). *The Nature of Learning*. New York: Harcourt, Brace and Co.
- (3) HUMPHREY, G. (1927). "The effect of sequences of indifferent stimuli on a reaction of the conditioned response type." *J. Abn. Soc. Psychol.* XXII, 194.

(Manuscript received 18 August 1947)

NOTICE OF CONFERENCE

A Speech Therapy Conference

will be held on

20, 21, 22, 23 & 24 SEPTEMBER 1948

at the

ROYAL SOCIETY OF MEDICINE

1 WIMPOLE STREET, LONDON, W.1

There will be sessions on the following subjects:

THE AIM AND SCOPE OF SPEECH THERAPY.

THE EMOTIONAL BACKGROUND OF STAMMERING (stuttering).

SPEECH DISORDERS ARISING FROM HEAD INJURIES (recent additions to the knowledge of the causation of aphasia and dysphasia).

THE SPEECH CLINIC AND THE SPEECH DEFECTIVE CHILD.

THE ROLE OF EMOTIONAL PROBLEMS IN PRODUCING DISORDERS OF SPEECH.

and

GENERAL SESSIONS during which MEMBERS OF THE CONFERENCE will present papers on various aspects of speech therapy and closely related subjects.

PUBLICATIONS RECENTLY RECEIVED

Reading and Visual Fatigue. By LEONARD CARMICHAEL and WALTER F. DEARBORN.
Boston: Houghton Mifflin Co. 1947. Pp. xiv + 483. \$5.00.

This is a book of very great importance. Its significance indeed extends far beyond the specific topics of reading and visual fatigue which are its immediate concern. Nobody who is interested in understanding the mechanism of continued exercise in any direction of human behaviour can afford to neglect it. Moreover, it is written in a singularly clear and concise scientific style.

The first chapter, called *What is Fatigue?*, presents by far the best brief account of experimental work upon human fatigue that has as yet been published anywhere. The general conclusion that at present it is best not to adopt any hard and fast definition in terms of some specific process, but to admit frankly that what has to be studied are any demonstrable changes of function which accompany continued exercise, will meet with the warm approval of most people who have worked at all comprehensively in this field. "Only by the use of many different approaches", our authors say, "can an increasingly useful and adequately knowledge be secured of the varied phenomena of human work called by the single name *fatigue*."

There follow an admirable analysis of the visual task of reading and records of a large number of splendidly planned and executed experiments. The detail and methodology of these are too complicated to describe in this short notice, but whether the procedure follows long-established technique, or, as especially in the study of the "electro-oculogram", makes an original use of recent electronic advances, it is carefully and adequately controlled and adapted to the ends in view. After this the results are discussed and interpreted and there is a masterly final summing up and statement of the conclusions.

These conclusions, thoroughly well supported here, are of intense interest, though they will probably surprise only those whose knowledge of human "fatigue" is based merely upon an acquaintance with the general text-books. "A book can be read by a normal subject continuously for six hours without undue signs of fatigue." Similarly, "microfilm reading can be carried on for six hours without unduly fatiguing the normal subject." In both cases it is implied that lighting conditions are satisfactory and any desirable visual corrections have been made. "Undue fatigue" means the occurrence of significant measurable objective changes of reading performance. Moreover, in the main experiments the method was adopted of introducing for the readers a type of intermittent objective test every twenty-five minutes. This had the effect of giving the subjects a kind of knowledge of results, and may, as the authors suggest, have set up a state of steady high level adaptation. In some earlier four-hour experiments, where the objective references were not present, there was evidence of some work decrement or change: rests and pauses, eyes roaming with no reading, and so on. The authors like to think that their special technique operates by maintaining motivation. However this may be, the results are strongly reminiscent of the phenomenon of "lowered standard" which has been found in other cases of continued exercise, where the operator demonstrably *can* do as well as he ever did but for some reason or other does not. What is particularly interesting is that if he does go on doing his best, there is no evidence whatever that his work or he himself suffers in any way whatsoever, though this is not yet, it is admitted, a closed question.

President Carmichael and Dr Dearborn are to be heartily congratulated on a piece of work which should bring to them an access of deserved renown, and to many a mass of rewarding problems.

General Psychology. By W. J. H. SPROTT. Second edition. London: Longmans Green and Co., Ltd. 1947. Pp. ix + 467. 14s.

Here is a new edition of an excellent text-book. Most of the first part, dealing in the main with human action and its determination, has been either rewritten or fairly thoroughly revised. The result is to improve an already good work. The general criticism that rather a lot is attempted in rather too little space remains valid. But it is not a very serious one, for the treatise is introductory only and plenty of good references for further study are made. There are few books better than this for the intelligent general student who is near the beginning of his career.

The Psychology of Ego-Involvements. By M. SHERIF and HADLEY CANTRIL. London: Chapman and Hall. 1947. Pp. vii + 525. 36s.

It is unlikely that the title of this book will convey anything definite to most English readers; and it is far from easy to say briefly and decisively what it really does mean, but the attempt must be made.

From the beginning of its separate existence the human organism is subjected to an immense variety of stimuli, some coming from its physical environment, but many of the most important from the already organized social groups within the sphere of influence of which it must live. Almost none, perhaps literally none, of these is accepted simply because it happens to be present. Some produce no noticeable effects at all, others give rise to transient change of behaviour, and others again set up long-lasting results which themselves become predominant in settling the course of a great amount of subsequent conduct. Which of these things happens is regarded as mainly a function of 'attitude'.

'Attitude' is a terrible term to define but it seems to mean that nothing, or almost nothing, in human life is ever determined by one simply or single set of receptor elements. What the eyes see, for example, is not settled by retinal function alone, or even by retino-central functions alone, but involves the active co-operation of a number of other receptors and effectors, though in this case the visual ones may be predominant. This process of active co-operation is what constitutes an attitude. Some of the sets or attitudes are repeated frequently, and whether because of this or for some other reason they become well established, and the organism looks upon them as its own. Thus comes the ego, not born complete, or ever entirely completed by experience; changing all the time, but normally in an orderly way, and with its most significant changes positively related to the process of ageing. Once some stability of attitudes is achieved, every time they come into play there is 'ego involvement'. They come into play all the time and in every sort of conduct, but in particularly important ways in social conduct.

This, in a simple form, is the basic theoretic standpoint of the whole volume. It is not in any way dogmatically laid down. It is discussed, with a wealth of documentation and experimental evidence, in the first five chapters. Much of the earlier evidence is drawn from a wide range of well attested experiments on perceiving, imaging and remembering, but very soon a strong social bias makes itself clear, and a great part of the book is concerned to show how a variety of social 'norms' find attitudinal expression and determine behaviour which claims to be, and may seem to be, individual. An unsolved problem here is whether these 'norms' gain their attitude-like functions by the same kind of processes as those which develop the more physically directed attitudes. It is suggested that social attitudes are usually formed "through verbalised short-cut dicta or value judgements" apparently taken over directly from adults. There is need for more work on this matter.

The basis of theoretic interpretation having been laid down and fully illustrated, a full chapter is devoted to a consideration of 'ego-involvements' in laboratory experiments, and after this the authors' views about the development of ego expression and its relation to ageing are set forth. It is argued that there is a re-formation of the ego at adolescence, but little is said about later changes. Following this, the play of ego-involvement in specifically social group situations is considered. Perhaps rather too much of this tends to treat the problem as in the main one of projection. Important as projection may well be there are other forms equally important. Moreover, a good deal of what is called projection looks, in view of some of the earlier argument, to be merely putting interpretations back to the place from which they came. Lastly, *Breakdowns of the Ego* are considered, and there is a final chapter of criticism of Freudian interpretation which the reader is likely to find good or bad according to his predilections.

This is a very important book, not easy, and not as fully pruned as it ought to have been, but both original and learned. It is much to be hoped that it will be widely read and used as a starting-point for many experiments.

Emotional Problems of Living. By O. SPURGEON ENGLISH and GERALD H. J. PEARSON. London: George Allen and Unwin, Ltd. 1947. Pp. 438. 16s.

"The book", it is said, "explains to the reader in detail the entire psychological development of the human being.... It is based on the Freudian concept of personality-formation because the authors feel that psychoanalysis is the best approach to an understanding of human nature." In plan the volume follows all the stages of individual development which conventional Freudian theory recognizes. The emotional disturbances characteristic of each stage are described in considerable detail. There is nothing very markedly original but there is a great amount of information widely collected from many sources.

Treatment is discussed throughout and also in detail in a final chapter. It may be a very good book for level-headed folks who are worried about others; not so good for any who are worried about themselves. It is unnecessarily long.

Essays on Contemporary Events. By C. G. JUNG. London: Kegan Paul, Trubner, Trench and Co. Ltd. 1947. Pp. xviii + 90. 8s. 6d. net.

These essays, written for the general reader, express in an elegant literary form the author's opinions about the state of mind of the Germans before and during the war.

Clinical Studies in Psychopathology. By HENRY V. DICKS. Second edition. London: Edward Arnold and Co. 1947. Pp. 238. 15s. net.

Although little new has been added to this edition, the text has been thoroughly revised throughout.

The book comprises a series of lectures on anxiety and obsessional states, hysteria, sexual perversions and drug addiction; the psychoses are not discussed. Thus its scope is similar to that of the psychopathology of Freud. The author claims that his approach is eclectic, however, although the method by which his data were obtained was that of psychoanalysis. Again, his inferences are expressed in Freud's terms, and the greater part of his explanations is derived from Freud's theory. He writes (p. 12): "But when the [Freudian] method, *in addition*, has demonstrated an intelligible and ordered aetiological, causal, teleological sequence in what previously seemed chaotic and absurd, as well as having reasonably accounted for the causes of failure in other cases, then we are dealing with a weapon of attack which answers to the requirements of science." One might wish that he had applied more rigorous standards before accepting explanatory principles. Had he done so, and had he made a clearer distinction between observation and inference, he might have been less able to explain the many confused problems with which he deals, and certainly his book would have been less readable.

D.R.D.

Sigmund Freud: An Introduction. By W. HOLLITSCHER. London: Kegan Paul, Trubner, Trench and Co. Ltd. 1947. Pp. viii + 119. 8s. 6d.

The greater part of this book consists of a condensed but reasonably accurate presentation of Freud's views about psychology. A foreword and a concluding chapter attempt to make a case for the value of Freudian theory to the sociologist. Unfortunately, the case is not stated in such a way that it is likely to leave the sociologist with any very clear ideas, and though he may well benefit from a study of the main part of the work, he will be left to develop his main applications for himself.

From Failure to Fulfilment: A Minister's Notebook on Psychological Method. By JOHN MARTIN. London: George Allen and Unwin, Ltd. 1946. Pp. 168. 7s. 6d.

Every minister of religion or other social worker meets with a large number of difficult problems in individual behaviour and underlying belief. Some of the main groups of these are here very clearly and straightforwardly described and indications of a common-sense kind are given as to how they may be treated. It is an excellent little book for anybody who, working especially with adults, has to assume the functions of the 'clinical psychologist'.

The Mask and the Face. By KENNETH MELVIN. London: Methuen. 1948. Pp. xxii + 297. 9s. 6d.

This book proposes to introduce the general reader to himself. Each chapter, after the first, begins with a questionnaire, and the indomitable and courageous reader is invited to characterize himself in various ways. Then he can read about the characteristics he has assigned to himself and many others and find out perhaps that they indicate things beyond most of his dreams. The writing is extremely lively, full of anecdotes, allusions and quotations. It is entertaining, but how illuminating the reader must discover for himself.

Dark Legend: A Study in Murder. By FREDERIC WERTHAM. London: Victor Gollancz, Ltd. 1947. Pp. 119. 6s.

Dr Wertham is a Senior Psychiatrist, Department of Hospitals, New York City, and the Director of a Mental Hygiene Clinic. He tells here the story of a youth of seventeen who, living in a New York tenement area, killed his own mother. The boy was committed to a State Asylum and studied for a long time by Dr Wertham. As a detective seeks for a murderer so—according to his own way of putting it—the doctor, knowing the murderer, searched for his motive. Here the story, of which, it is said, “all the facts are true”, is told in a somewhat novelistic style and with a considerable amount of generalization, but in a way that many readers will find both interesting and probably enlightening.

Alexander Bryan Johnson's A Treatise on Language. Edited, with a critical essay on his philosophy of language, by DAVID RYNIN. University of California Press (Cambridge University Press). 1947. Pp. ix + 443. 27s. 6d.

The original treatise was published in 1828 and revised eight years later. In accordance with the times Johnson was more bent towards a logical and philosophical approach than towards the psychological. However, any psychologist with an interest in semantics will find a number of interesting remarks and speculations both in the text and in Rynin's very excellent explanatory essay.